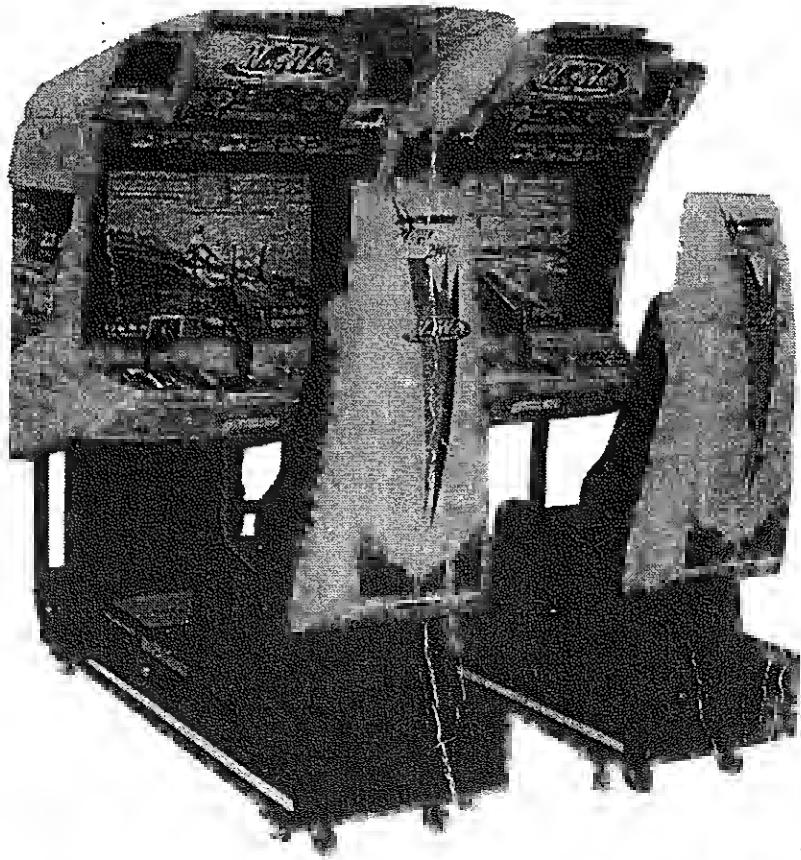


# SEGA



## OWNER'S MANUAL



**SEGA ENTERPRISES, LTD.**

MANUAL NO. 4201-6139-01

## Table of Contents

	Page
<b>Introduction of the Owner's Manual</b>	
1. Handling Precautions .....	1
2. Prevention of Counterfeiting and Conversion .....	2
3. Precautions Concerning Installation Location .....	3
4. Name of Parts .....	4
5. Accessories .....	5
6. Moving the Machine .....	6
7. How to Play .....	12
8.1 Switch Unit .....	15
8.2 Test Menu .....	16
8.3 Memory Test .....	17
8.4 Input Test .....	18
8.5 Sound Test .....	19
8.6 C.R.T. Test .....	19
8.7 Game Assignments .....	20
8.8 Coin Assignments .....	21
8.9 Bookkeeping .....	25
8.10 Backup Data Clear .....	27
8.11 Output Test .....	27
8.12 Volume Setting .....	28
8.13 Communication Setting .....	30
9. Control Panel .....	31
9.1 Opening the Control Panel .....	31
9.2 V.R. Replacement .....	31
9.3 Switch Replacement .....	32
9.4 Greasing .....	32
10. Throttle .....	33
10.1 Removing the Throttle .....	33
10.2 Adjustment and Replacement of Volume .....	34
10.3 Greasing .....	34
11. Coin Selector .....	35
12. Monitor Adjustments .....	36
13. Replacing the Fluorescent Lamp, and Lamps .....	37
14. Periodic Check .....	37
15. Troubleshooting .....	38
16. Game Board .....	39
16.1 Removing the Board .....	39
16.2 Composition of Game Board .....	40
17. Design Related Parts .....	41
18. Parts List .....	42
19. Wiring Diagram .....	63



## 1. HANDLING PRECAUTIONS

### SPECIFICATIONS

WIDTH	:	62.5 in
DEPTH	:	59 in
HEIGHT	:	72 in
WEIGHT	:	Approx. 475 kg. (1200 lbs.)
POWER, MAXIMUM CURRENT	:	900W 7.5A (AC 120V 60 Hz AREA)
MONITOR	:	25 INCH MEDIUM RESOLUTION COLOR MONITOR X 2

NOTE: Descriptions in this manual are subject to change without prior notice.

When installing or inspecting the machine, be very careful of the following points and pay attention to ensure that the player can enjoy the game safely.

- Be sure to turn the power off before working on the machine.
- To insert or pull out the plug quickly is dangerous.
- It is necessary to make sure that the power cord or the grounding wire is not exposed on the road, etc. in a manner so as to be dangerous. Make sure that grounding connections are made safely at the position where so specified.
- Do not use any fuse that does not meet specified rating.
- Make complete connections for the IC board and other connectors. Insufficient insertion is very dangerous.
- The operating (ambient) temperature range is from 5°C to 40°C.
- When cleaning the CRT surfaces, use a soft, dry cloth. Do not apply chemicals such as thinner, benzine, etc.

Also, for the IC board circuit inspections, only the logic tester is allowed. The use of a tester is not permitted, so be careful in this regard.

After confirming that there are no irregularities, turn the power ON.

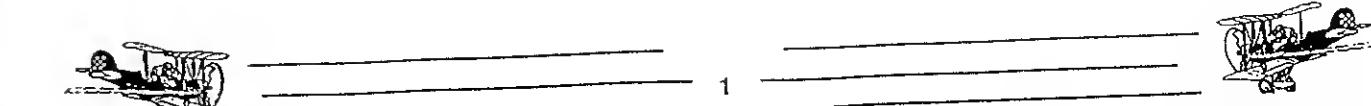
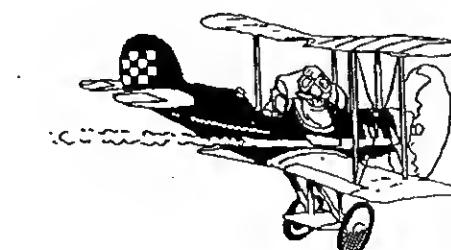
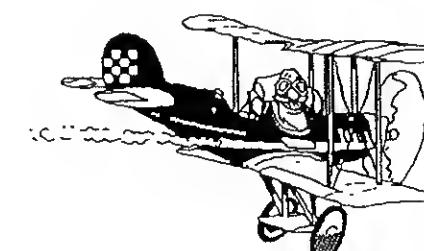
## INTRODUCTION OF THE OWNER'S MANUAL

SEGA ENTERPRISES, LTD., supported by its high electronic technology of LSIs, microprocessors, etc. and a wealth of experience, has for more than 30 years been supplying various innovative and popular game machines to the world market. This Owner's Manual is intended to provide detailed descriptions together with all the necessary information covering the general operation of electronic assemblies, electromechanicals, servicing control, spare parts, etc. as regards WING WAR, a new SEGA product.

This manual is intended for those who have knowledge of electricity and technical expertise especially in ICs, CRTs, microprocessors, etc. Carefully read this manual to acquire sufficient knowledge before working on the machine. Should there be a malfunction, non-technical personnel should under no circumstances touch the interior system. Should such a case arise, contact our Main Office or the closest branch office listed as follows:

SEGA ENTERPRISES, INC. (U.S.A.)/CUSTOMER SERVICE  
45133 Industrial Drive, Fremont, California 94538, U.S.A.

Phone: (415) 802-1750  
Fax: (415) 802-1754



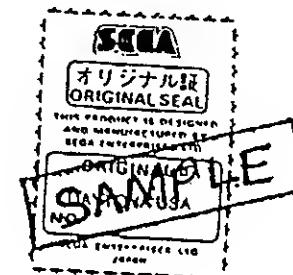
## 2. PREVENTION OF COUNTERFEITING AND CONVERSION

### LABELING

To prevent counterfeits and conversions, the following labels are put on all SEGA products. When handling such goods, be sure to confirm the labels. They are used to prevent illegal acts such as the unauthorized copying of the products and the printed circuit boards thereof or carrying on business by manufacturing similar merchandise or by converting, selling or using such products or printed circuit boards.

#### ORIGINAL SEAL

The following seal is put on the machines manufactured by SEGA.



#### LICENSE SEAL

The following seal is put on all SEGA kits, such as the printed circuit board.

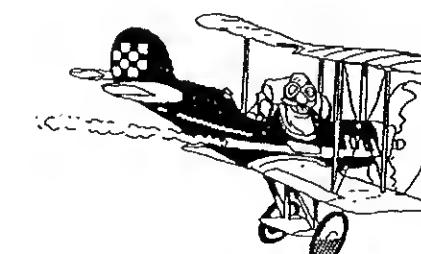


### COPYRIGHT NOTICE

This SEGA product has the copyright notice as follows:

© SEGA 1994

This signifies that this work was disclosed in 1994 and is the property of SEGA ENTERPRISES, LTD.



## 3. PRECAUTIONS CONCERNING INSTALLATION LOCATION

The WING WAR is an indoor game machine. Absolutely do not install it outside. Even indoors, avoid installing in places mentioned below so as to ensure proper usage:

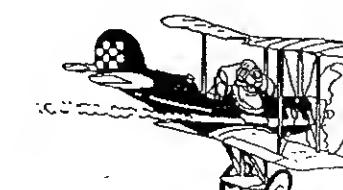
- Places subject to rain or water leakage, or condensation due to humidity.
- In the proximity of an indoor swimming pool and/or shower.
- Places subject to direct sunlight.
- Places subject to heat sources from heating units, etc., or hot air.
- Vicinity of highly inflammable/volatile chemicals or hazardous matter.
- Sloped surfaces.
- Vicinity of anti-disaster facilities such as fire exits and fire extinguishers.
- Places subject to any type of violent impact.
- Dusty places.

### INSTALLATION PRECAUTIONS

- 1) Do not insert more than one electrical plug into the power plug socket.
- 2) The per unit standard voltage/amperage is 100~120V/15A.
- 3) Use of extension cables should be avoided. If you must use, ensure the extension cables are rated at 15A or higher for 100~120 volt areas or 10A.
- 4) Note that for transporting the machine into the location's building, the minimum necessary dimensions of the opening (of doors, etc.) are 36 in (W) and 80 in (H).
- 5) For the operation of this machine, secure a minimum area of 80 in (W) x 70 in (D).

### ELECTRIC CURRENT CONSUMPTION

MAX. 7.5A (AC 120V 60Hz)



#### 4. NAME OF PARTS

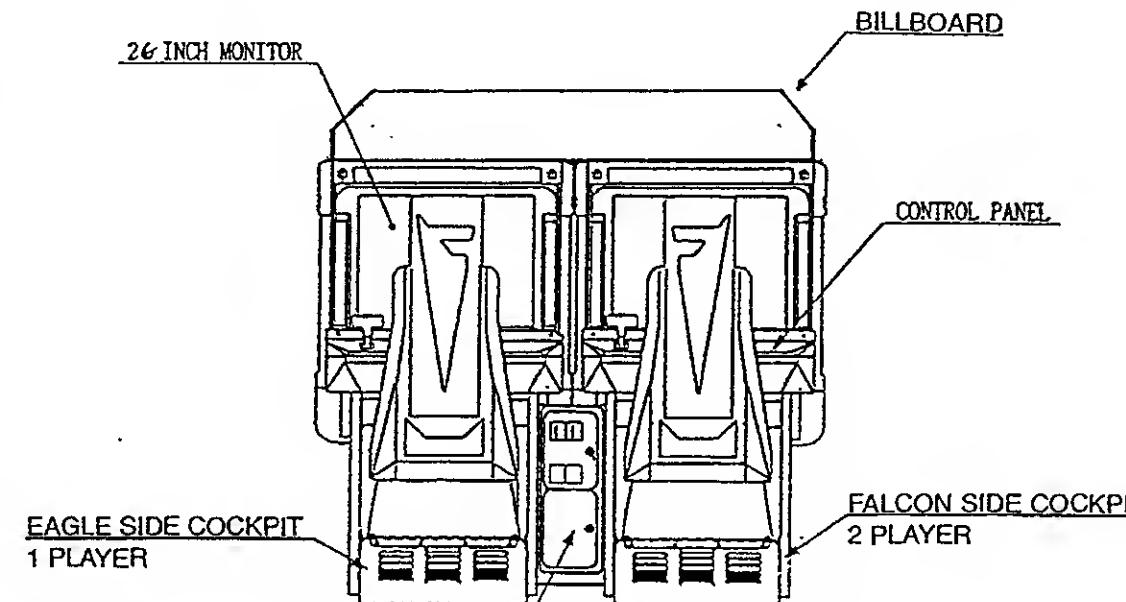


FIG. 4.1 OVERVIEW

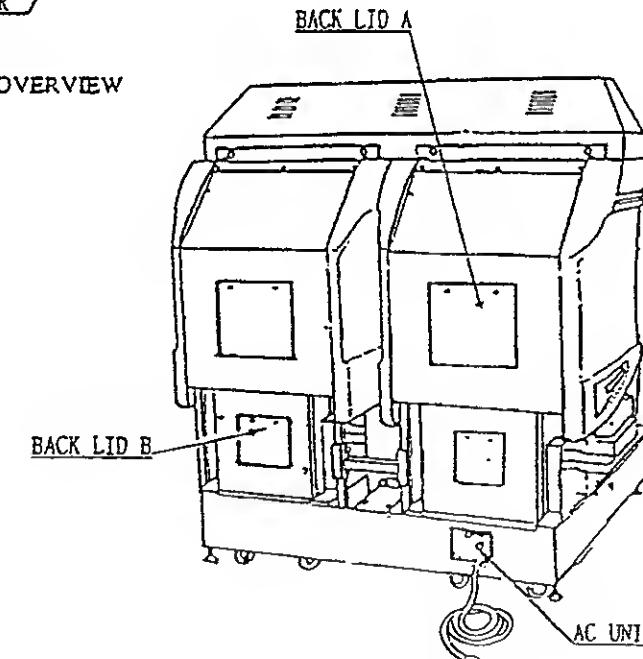


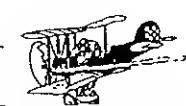
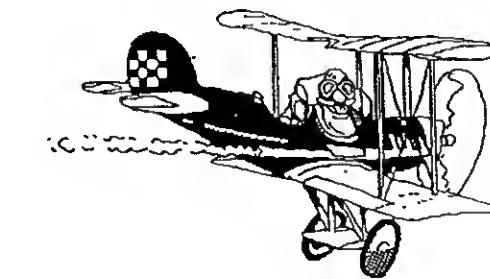
FIG. 4.2 REAR VIEW

#### 5. ACCESSORIES

The following parts are supplied.

TABLE 5 ACCESSORIES

PART NO.	QTY.	PART NAME
	2	KEY
	1	OWNERS MANUAL WING WAR
	1	T-10 TAMPER PROOF WRENCH
	1	T15 TAMPER PROOF WRENCH
	1	T25 TAMPER PROOF WRENCH
	1	T27 TAMPER PROOF WRENCH
	1	3/16 HEX WRENCH



## 6. PRECAUTIONS TO BE HEeded WHEN ASSEMBLING AND MOVING THE MACHINE

### WARNING:

- (1) Perform the assembly work by following the procedure herein stated. Failing to comply with the instructions, for example, inserting the plug into an outlet at the stage not mentioned in this manual might cause an electric shock accident.
- (2) Assembling should be performed as per this manual. Since this is a complex machine, erroneous assembling may cause damage to the machine, or malfunctioning to occur.
- (3) When assembling, be sure to perform the work by plural persons.

When carrying out the assembly work, follow the procedure in the following sequence:

ASSEMBLING THE COCKPIT

INSTALLING THE BILLBOARD

SECURING IN PLACE (LEG ADJUSTER ADJUSTMENT)

INSTALLING THE AC COVERS (WIRING CONNECTION)

POWER SUPPLY, AND EARTH CONNECTION

TURNING THE POWER ON

ASSEMBLING CHECK

Note that the master key and the cashbox door key (accessories) in addition to the tools such as a screwdriver, wrench hexagon bolt and socket wrench are required for the assembly work.

### CAUTION:

Perform the tightening of hexagon bolts described above after adjusting the leg adjusters. Make sure that until the leg adjuster adjustments are made, keep the hexagon bolts tightened temporarily.

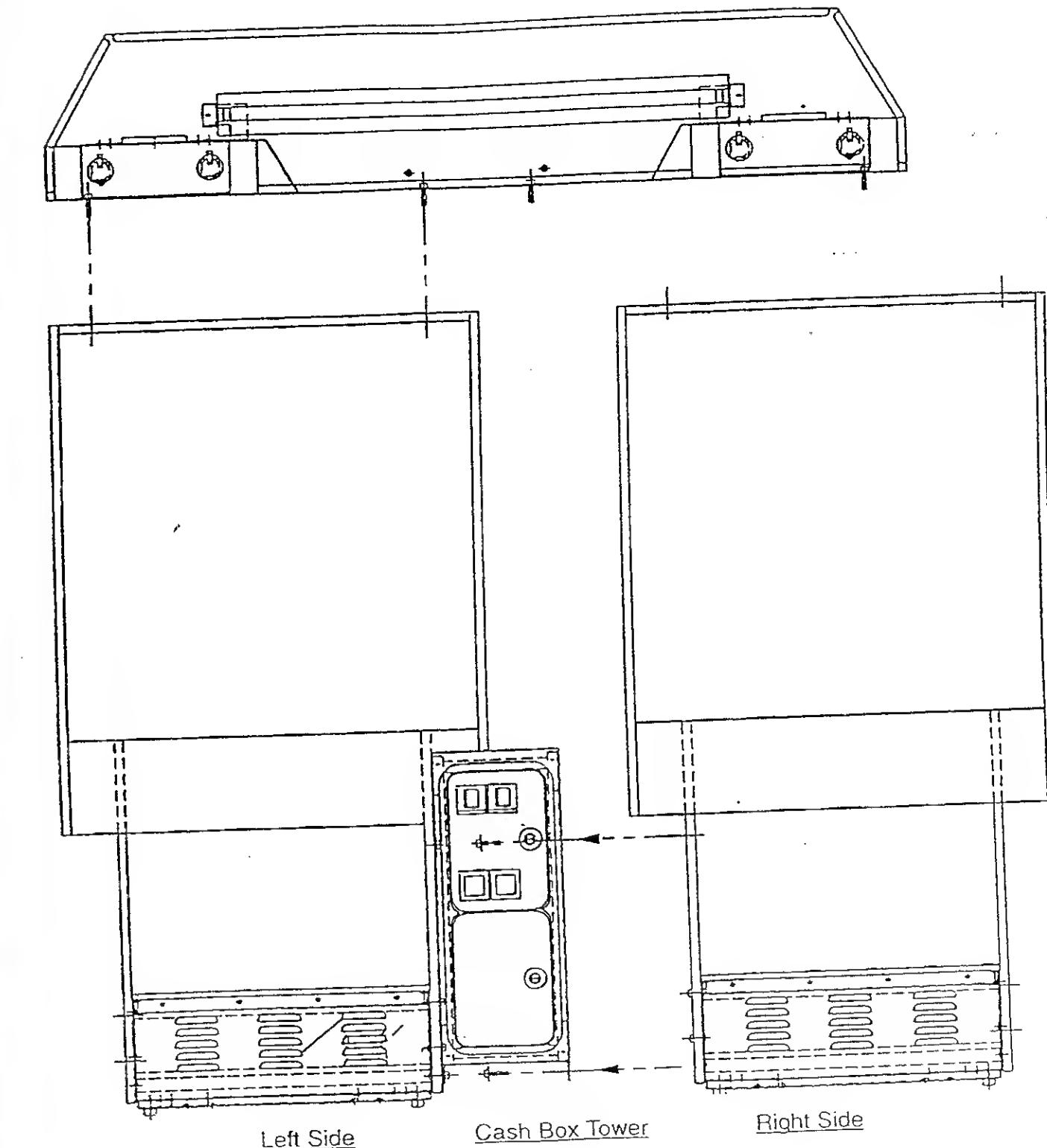


Figure 6.1B

Front View



**CAUTION!**

The optic fiber cable is used for the communication linkage. Excessive bending may damage the communication cable. Be very careful in this regard.

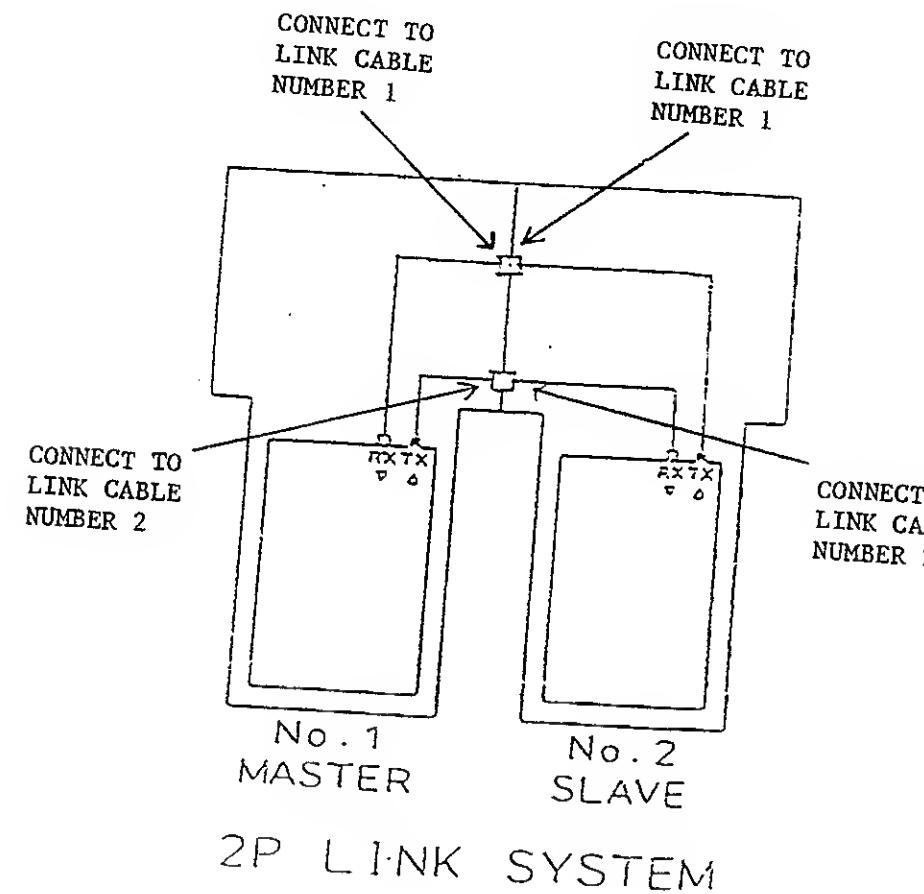
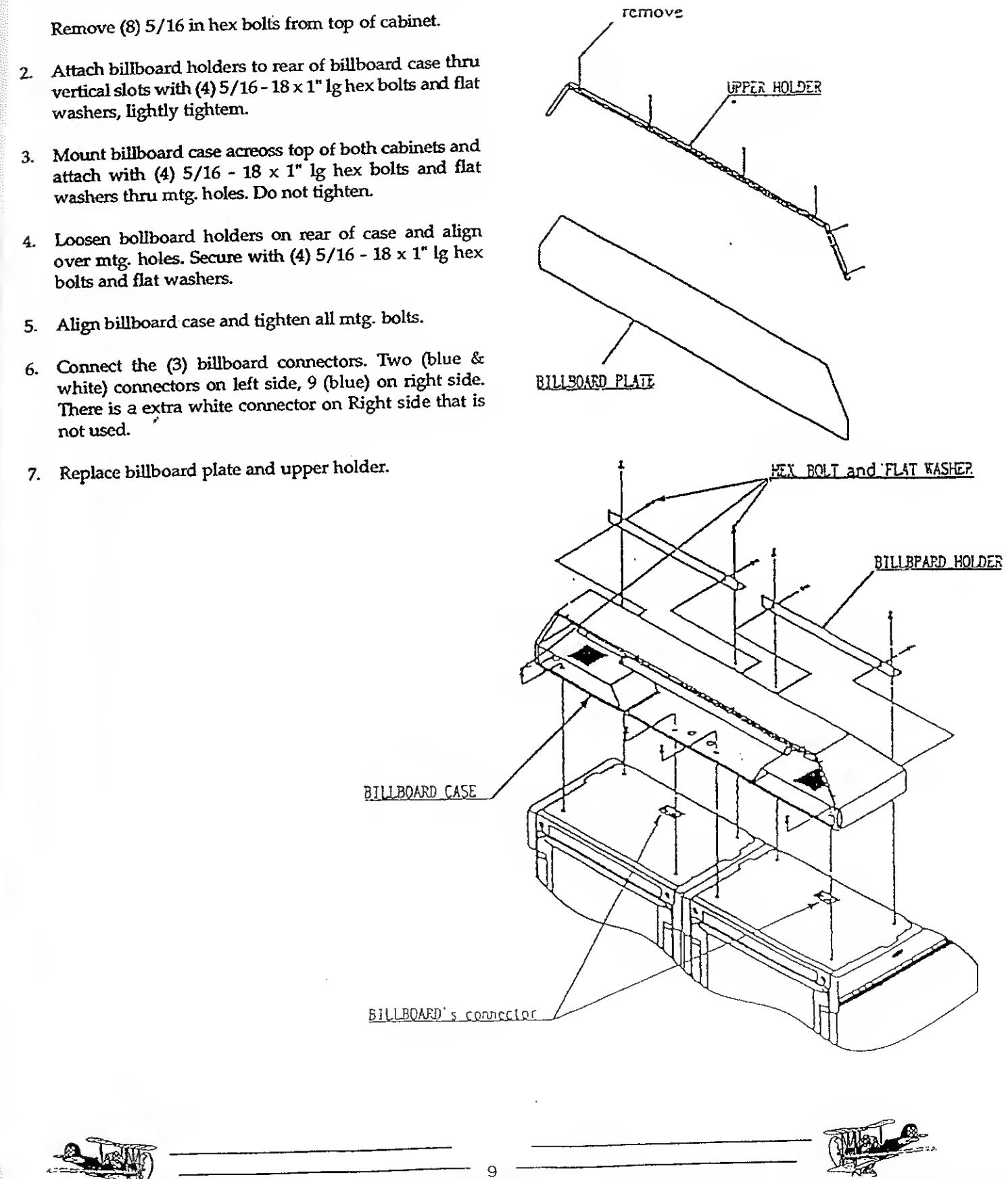


Figure 6.1C

Front View

**BILLBOARD INSTALLATION**

1. Remove billboard form carton and remove upper holder and billboard plate. Remove billboard holders and hardware package from inside billboard case.
2. Remove (8) 5/16 in hex bolts from top of cabinet.
3. Attach billboard holders to rear of billboard case thru vertical slots with (4) 5/16 - 18 x 1" lg hex bolts and flat washers, lightly tighten.
4. Mount billboard case across top of both cabinets and attach with (4) 5/16 - 18 x 1" lg hex bolts and flat washers thru mtg. holes. Do not tighten.
5. Loosen billboard holders on rear of case and align over mtg. holes. Secure with (4) 5/16 - 18 x 1" lg hex bolts and flat washers.
6. Align billboard case and tighten all mtg. bolts.
7. Connect the (3) billboard connectors. Two (blue & white) connectors on left side, 9 (blue) on right side. There is a extra white connector on Right side that is not used.
8. Replace billboard plate and upper holder.



### ③ SECURING TO THE INSTALLATION POSITION (LEG ADJUSTER ADJUSTMENT)

#### WARNING!

Make sure that all of the leg adjusters are in contact with the floor. If they are not, the cabinet may move and cause an accident to occur.

This machine has eight casters and eight leg adjusters (Fig 6.6). When the installation position is determined, cause the leg adjusters to come into contact with the floor directly, make adjustments in a manner so that the casters will be raised approximately 5 mm. from the floor and make sure that the machine position is level.

- 1) Move the machine to the installation position. When installing the machine against or close to a wall, be sure to secure a passage space to enable the player to take a ride in the machine.
- 2) Attach the joint plate for the 2 internal leg adjusters shown. First, cause the other 6 leg adjusters to come into contact with the floor. Make leg adjuster adjustments with a wrench in a manner to ensure the machine's position is level (Fig. 6.6).
- 3) After making adjustments, fasten the leg adjuster nut upward and secure the height of the leg adjuster (Fig. 6.7).
- 4) Insert the notch portions of the joint plate to the 2 leg adjusters.
- 5) Lower the leg adjuster and fasten the nut upward. Secure the joint plate with the nuts and the bottoms of the leg adjuster (Fig. 6.8).

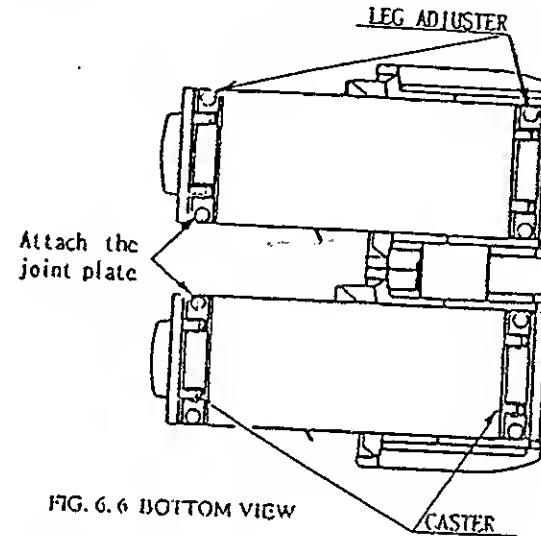


FIG. 6.6 BOTTOM VIEW

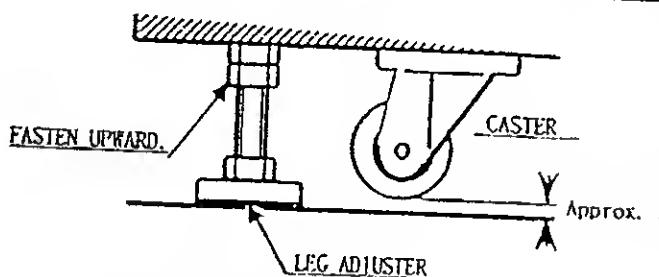


FIG. 6.7 LEG ADJUSTER

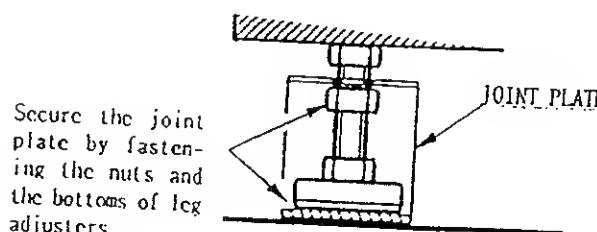
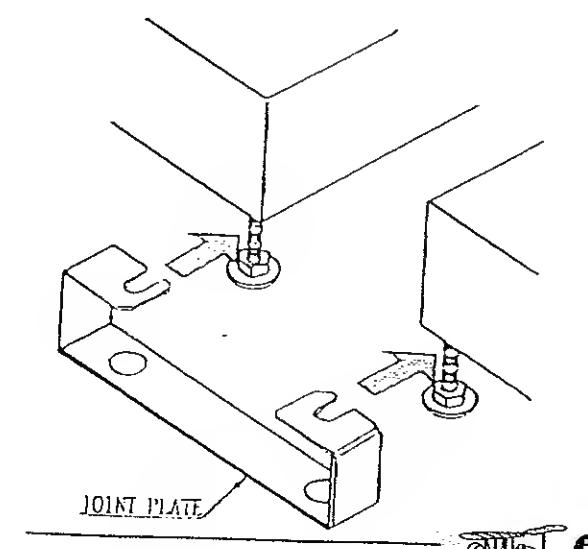
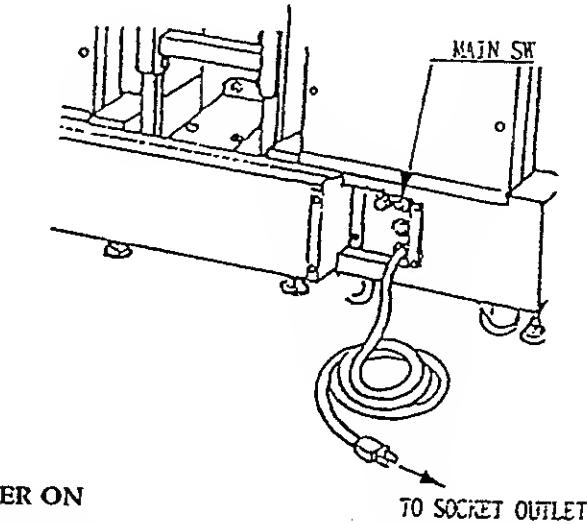


FIG. 6.8 JOINT PLATE



### ④ POWER SUPPLY AND EARTH CONNECTION

The AC UNIT is located on the back of the 1P cockpit (cabinet).



### ⑤ TURNING THE POWER ON

Turn the power ON by turning the AC UNIT's MAIN SW on. Turning the power on causes NETWORK CHECKING to be started automatically.

During the network checking, NETWORK CHECK is displayed on the screen. The current setting is displayed on the next screen. When NETWORK CHECKING is finished, the DEMO mode will appear on the monitor screen.

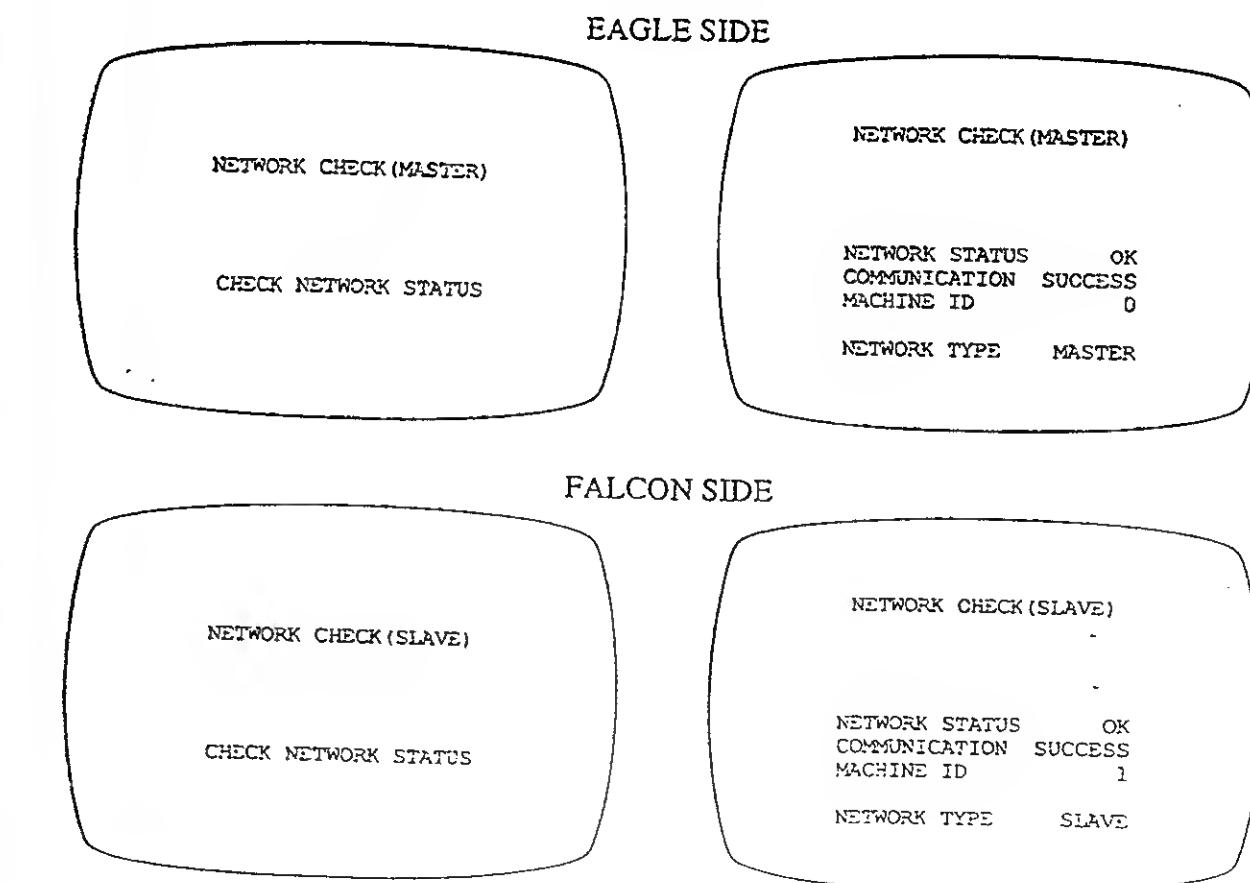


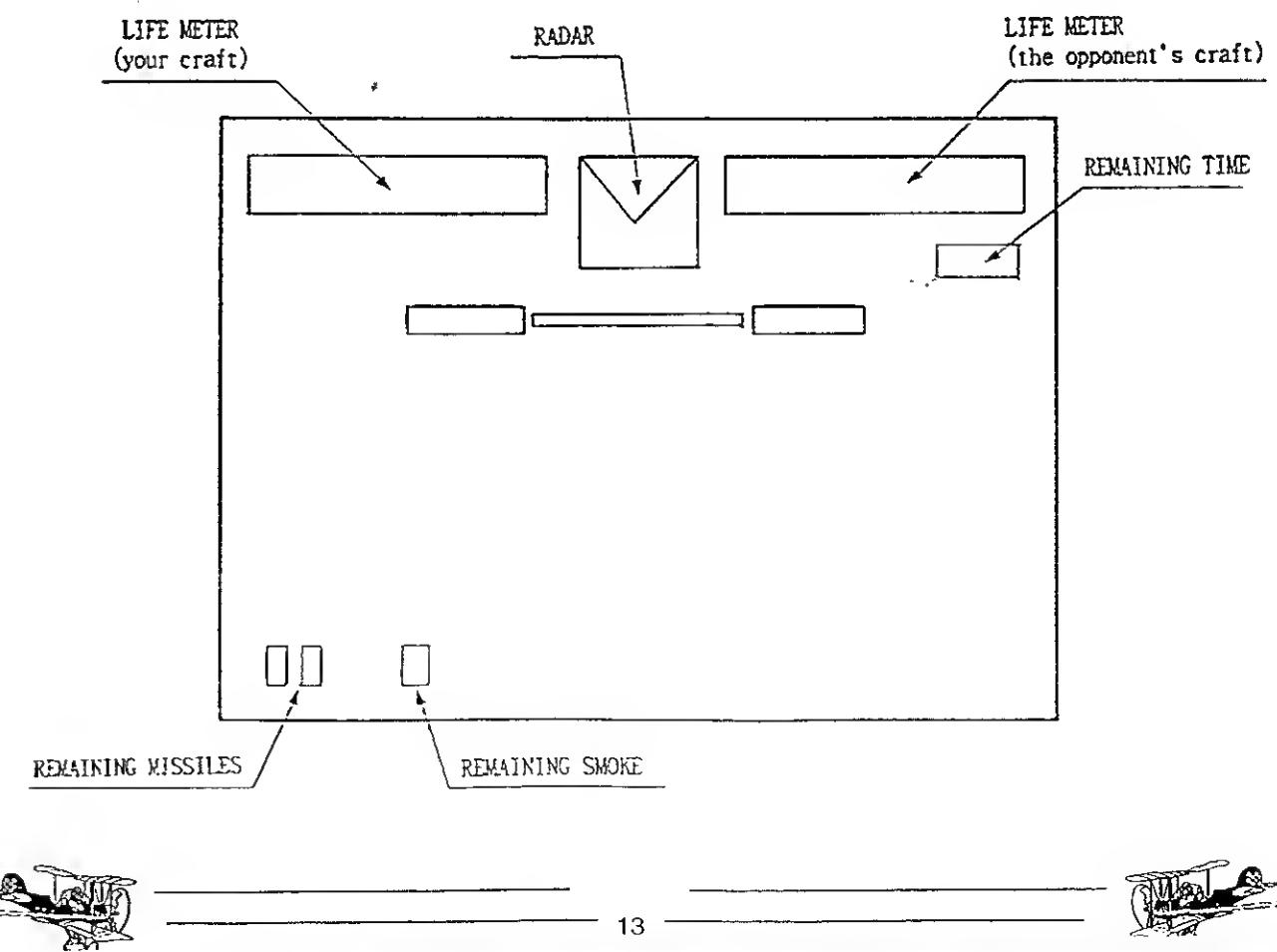
Fig. 6.11



## 7. HOW TO PLAY

FEATURES	
<b>Fokker Dr. 1</b>	pilot : MAX VON RICHTHOFEN
Nationality : Germany	Germany's small-sized super fighter in World War I with excellent swivelling performance. Throws the enemy into confusion!!
<b>Zero fighter</b>	pilot : HAYABUSA TENNOJI
Nationality : Japan	A remarkable dogfighter that reminds us of the Japanese spirit. Its maneuverability is the best of all 8 crafts. If you are confident of your skill, why not take up the challenge of controlling it!!
<b>Mustang</b>	pilot : HYU ADAMS
Nationality : U.S.A.	The best craft in World War II, the pride of the U.S.A. Has 6 machine guns allowing for very easy sighting!!
<b>Lightning</b>	pilot : VANESSA BATTLER
Nationality : U.S.A.	A large fighter with powerful thrust, often called an "evil twinbody craft." Has well-balanced attacking ability with both machine guns and missiles.
<b>Apache</b>	pilot : DAVE MACMAHON
Nationality : U.S.A.	An excellent dogfighter helicopter with rapid fire machine guns. Can fire 4 missiles simultaneously.
<b>Werewolf</b>	pilot : VLADIMIR MOSKVICH
Nationality : Russia	Russia's best hyper fighter helicopter with twin rotors. Has the greatest destruction force with 6 missiles that can be fired simultaneously.
<b>Harrier</b>	pilot : RAYMOND BISHOP
Nationality : England	The world's first V / STOL type jet fighter!! Carries homing missiles. An easy to handle type even for beginners.
<b>YAK - 141</b>	pilot : IRINA ROMANEVA
Nationality : Russia	The Russian Army's latest V/STOL type jet fighter. Being the only supersonic V / STOL type in the world, the performance of this craft far surpasses that of Harrier.

- ① Be seated and insert a coin(s). Press the START button to cause the screen (which allows you to choose either DOGFIGHT or EXPERT) to appear. Use the STICK for the selection.
- ② After the above selection, operate the controller to choose your craft.
- ③ Before starting the game, how-to-use the machine gun, missile, etc. is displayed on the screen.
- ④ In "DOGFIGHT," ATTACK and GUARD are repeatedly alternated every specified time.
- ⑤ During ATTACK, you continue to be positioned backward and the opponent, forward. Attack the opponent (positioned forward) with machine gun and missile.
- ⑥ During GUARD, you remain to be positioned forward and the enemy, backward. Evade the opponent's attack from behind, in the directions of up/down and left/right.
- ⑦ The "EXPERT" game is for the skillful players who would down the opponents by maneuvering the control stick and throttle lever.
- ⑧ If win or loss is not determined within the time limit, the player whose life meter's remaining energy displayed on the screen is greater than the other, wins.
- ⑨ Pressing the button beside the throttle lever allows any of the 4 perspectives, i.e., (1) COCKPIT, (2) TOP, (3) REAR, and (4) AUTOMATIC to be selected.



## 8. EXPLANATION OF TEST AND DATA DISPLAY

By operating the switch unit, periodically perform the tests and data check. When installing the machine initially or collecting cash, or when the machine does not function correctly, perform checking in accordance with the explanations given in this section. The following shows tests and modes that should be utilized as applicable.

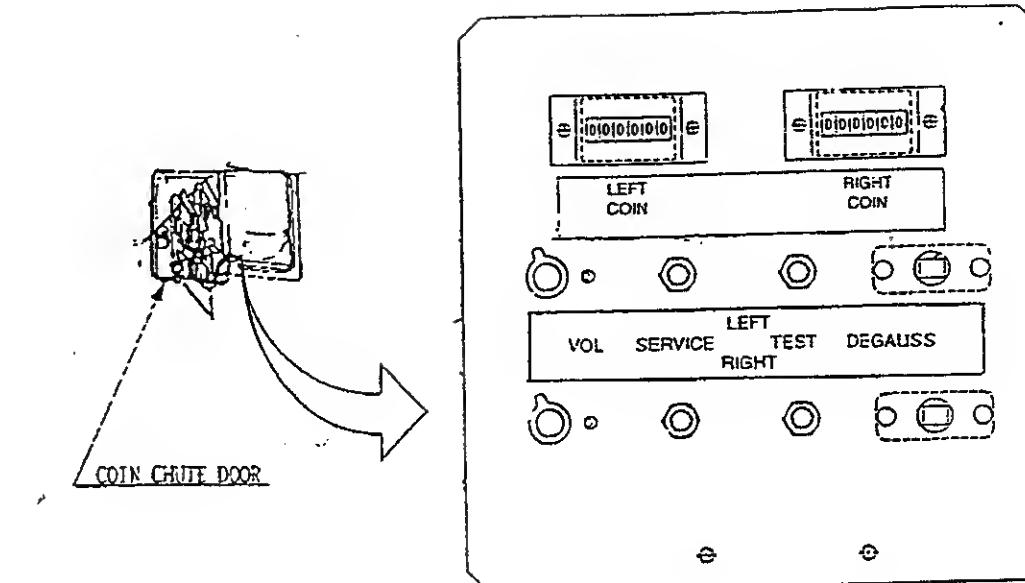
### CAUTIONS TO BE HEEDED WHEN USING THE TEST MODE:

Exiting from the test mode causes the machine to perform the network check automatically. During this time, the machine will not allow the game to be played in normal status. Therefore, be sure not to use the test mode if the other machine is in play. On the other hand, if one machine is in the test mode, make sure that the other machine is not in play. In the case where communication setting is made for a twin cabinet, when exiting from the test mode, start from the right-hand side cabinet (SLAVE) first.

TABLE 8.1 EXPLANATION OF TEST MODE

ITEMS	DESCRIPTION	REFERENCE SECTIONS
INSTALLATION OF MACHINE	When the machine is installed, perform the following: <ol style="list-style-type: none"> <li>Check to see that each setting is as per standard setting made at the time of shipment.</li> <li>In the INPUT TEST mode, check each SW and VR.</li> <li>In the OUTPUT TEST mode, check each of lamps.</li> <li>In the SELF-TEST mode, check ICs on the IC Board.</li> </ol>	8-7, 8-8 8-4 8-11 8-3
MEMORY	Choose MEMORY TEST in the MENU mode to allow the MEMORY test to be performed. In this test, PROGRAM RAMs, ROMs, and ICs on the IC Board are checked.	8-3
PERIODIC SERVICING	Periodically perform the following: <ol style="list-style-type: none"> <li>MEMORY TEST</li> <li>Ascertain each setting.</li> <li>In the INPUT TEST mode, test the CONTROL device</li> <li>In the OUTPUT TEST mode, check each of lamps.</li> </ol>	8-3 8-7, 8-8 8-4, 8-12 8-11
CONTROL SYSTEM	1. In the INPUT TEST mode, check each SW and VR. 2. Adjust or replace each SW and VR. 3. If the problem can not be solved yet, check the CONTROL's moves.	8-4 9, 10
MONITOR	In the MONITOR ADJUSTMENT mode, check to see if the MONITOR adjustment is appropriately made.	8-6 12
IC BOARD	1. MEMORY TEST 2. In the SOUND TEST mode, check the sound related ROMs.	8-3 8-5
DATA CHECK	Check such data as game play time and histogram to adjust the difficulty level, etc..	8-9

### 8-1 SWITCH UNIT



### FIG. 8.1 SWITCH UNIT

Open the coin chute door, and the switch unit shown will appear. The functioning of each SW is as follows:

**TEST SWITCH:** For the handling of the test button, refer to the following pages.

**SERVICE SWITCH:** Gives credits without registering on the coin meter.

**SOUND VOLUME:** Adjusts the volume of the monitor's right-hand side and left-hand side speakers, the control panel's right/left tweeters and the superwoofer under the seat.

**DEMAGNETIZER SWITCH:** Eliminates color unevenness from the screen.



## 8-2 TEST MODE

The Test Menu allows the functioning of each part of the Cabinet to be checked, the MONITOR to be adjusted, and the coins and game related various settings to be performed.

- Press the TEST BUTTON to cause the following Test Menu to be displayed on the monitor. (FIG. 8. 2)
- Press the SERVICE BUTTON until the pointer "→" is moved to the desired item.
- Bring the pointer "→" to the desired test item and press the TEST BUTTON to cause the selected item's test to start.

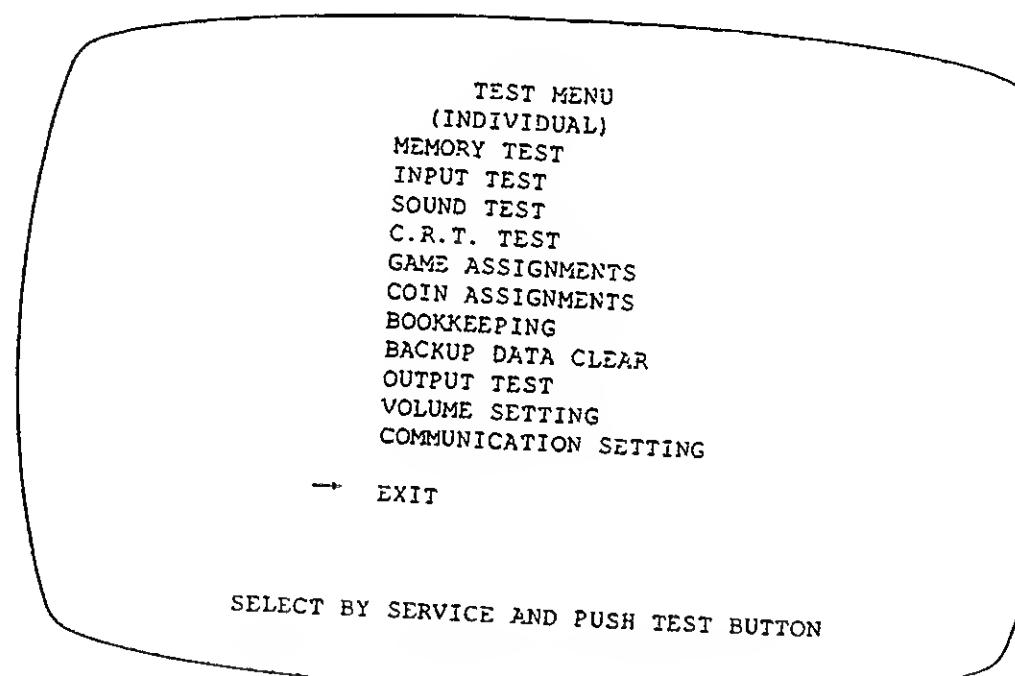


FIG. 8.2 TEST MENU

- Bring the arrow mark to (INDIVIDUAL) and press the TEST button to shift to (CONTINUE). In the case of (CONTINUE), exiting from a certain test item and returning to the menu screen causes the arrow to automatically proceed to the next test item.
- After the test is complete, move "→" to "EXIT" and press the TEST BUTTON to return to the Game Mode.

## 8-3 MEMORY TEST

The MEMORY TEST mode is for checking the on-BOARD memory IC functioning. "GOOD" is displayed for normal ICs and "BAD" is displayed for abnormal ICs.

A screenshot of the Memory Test results. The title is "MEMORY TEST". The results are organized into two sections: <ROM> and <RAM>. The <ROM> section contains 15 entries: IC4, IC6, IC8, IC10, IC14, IC19, IC21, IC51, IC67, IC69, IC71, IC75, IC91, IC106, and IC108. The <RAM> section contains 15 entries: IC5, IC7, IC9, IC11, IC15, IC20, IC22, IC52, IC68, IC70, IC72, IC76, IC92, IC107, and IC108. All entries are labeled "GOOD". At the bottom of the screen, the text "PUSH TEST BUTTON TO EXIT" is displayed.

MEMORY TEST				
<ROM>	IC4	GOOD	IC5	GOOD
	IC6	GOOD	IC7	GOOD
	IC8	GOOD	IC9	GOOD
	IC10	GOOD	IC11	GOOD
	IC14	GOOD	IC15	GOOD
<RAM>	IC19	GOOD	IC20	GOOD
	IC21	GOOD	IC22	GOOD
	IC51	GOOD	IC52	GOOD
	IC67	GOOD	IC68	GOOD
	IC69	GOOD	IC70	GOOD
	IC71	GOOD	IC72	GOOD
	IC75	GOOD	IC76	GOOD
	IC91	GOOD	IC92	GOOD
	IC106	GOOD	IC107	GOOD
	IC108	GOOD		

FIG. 8.3 MEMORY TEST

- When the test is completed, if the results are shown as above, it is satisfactory.
- It takes approximately thirty seconds to complete the test. If the period exceeds thirty seconds, this may have been caused by board malfunctioning.
- After finishing the test, pressing the TEST BUTTON allows the MENU mode to return to the screen.

## 8-4 INPUT TEST

When INPUT TEST is selected, the monitor will show the following, allowing you to watch the status of each switch and the value of each V.R. of the CONTROL PANEL. On this screen, periodically check the status of each switch & V.R.

- By pressing each switch, if the display on the right-hand side of the name of each switch changes to ON from OFF, the SW and the wiring connections are satisfactory.
- Bring the arrow mark to (INDIVIDUAL) and press the TEST BUTTON to shift to (CONTINUE). In the case of (CONTINUE), exiting from a certain test item and returning to the menu screen causes the arrow to automatically proceed to the next test item.
- To check COIN # 1 coin switch, open the COIN CHUTE DOOR and insert a token(s) from the token entry.
- To return back to the MENU mode, press the TEST BUTTON.

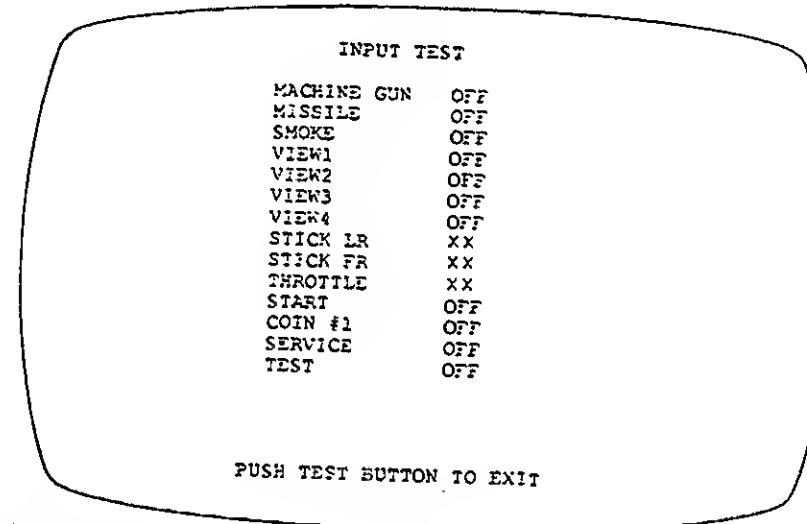


FIG. 8.4 INPUT TEST

- MACHINE GUN: MACHINE GUN TRIGGER input.
- MISSILE: MISSILE BUTTON input.
- SMOKE: SMOKE BUTTON input.
- VIEW1: "VIEW SELECTOR BUTTON 1" input.
- VIEW2: "VIEW SELECTOR BUTTON 2" input
- VIEW3: "VIEW SELECTOR BUTTON 3" input
- VIEW4: "VIEW SELECTOR BUTTON 4" input
- STICK LR: STICK left/right input
- STICK FR: STICK forward/backward input
- THROTTLE: THROTTLE LEVER input
- START: START BUTTON input
- COIN#1: COIN CHUTE #1 input
- SERVICE: SERVICE BUTTON input
- TEST: TEST BUTTON input.

Press the TEST button to cause it to be ON and release it to have the menu mode return on to the screen.

## 8-5 SOUND TEST

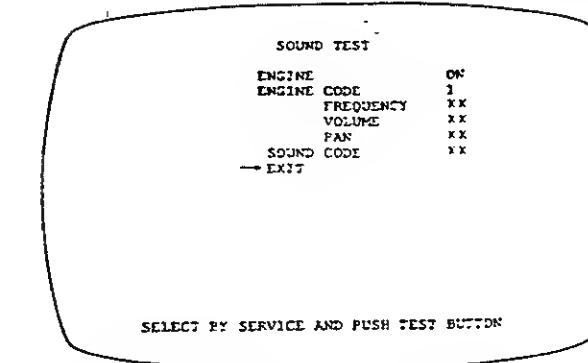


FIG. 8.5 SOUND TEST

- ENGINE: Bring the arrow mark and press the TEST BUTTON to cause the engine sound to be emitted.
- ENGINE CODE: Bring the arrow mark and press the TEST BUTTON to choose the type of engine sounds (No. 1 to No. 8).
- FREQUENCY: Operating the throttle lever forward and backward changes the value and causes the interval of the engine sound outputted from the speaker, to vary in accordance with the value change.
- VOLUME: Operating the control stick forward and backward changes the value and causes the volume of the engine sound outputted from the speaker, to vary in accordance with the value change.
- PAN: Inclining the control stick right and left changes the value and causes the engine sound outputted from the speaker, to be directed to the right or left in accordance with the value change.
- SOUND CODE: Bring the arrow mark to this and press the TEST BUTTON to cause the BGM (background music) and sound effects used during the game, to be produced. (0 ~ 263)
- EXIT: Bring the arrow mark to this and press the TEST BUTTON to return back to the menu screen.

## 8-6 C.R.T. TEST

Selecting the "C.R.T. TEST" from the menu screen in the test mode allows the screen (on which the monitor is tested) to be displayed. Although the monitor adjustments have been made at the time of shipment from the factory, make judgment (by watching the test mode screen) as to whether an adjustment is needed. If it is necessary, adjust the monitor by referring to Section 12.

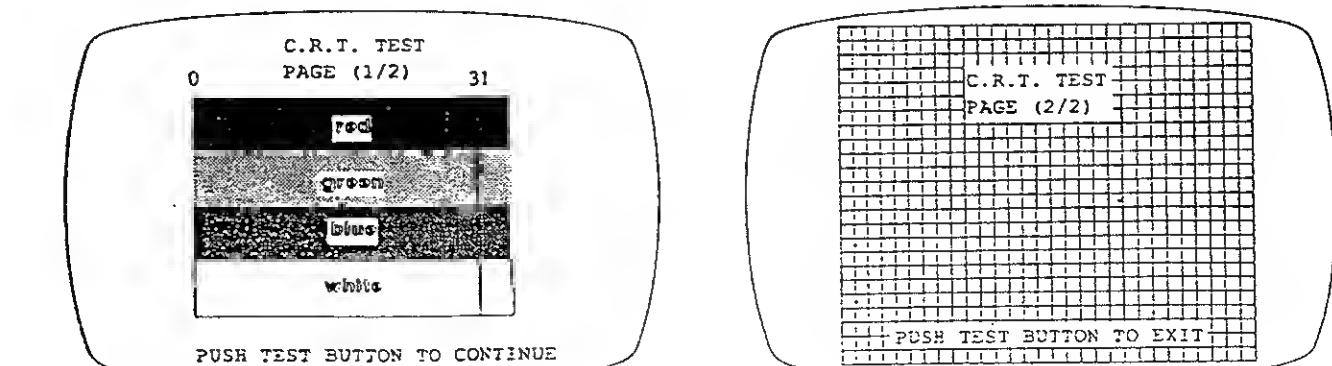
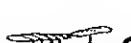


FIG. 8.6 C.R.T. TEST



## 8-7 GAME ASSIGNMENTS

For GAME ASSIGNMENTS, bring the SERVICE BUTTON to the desired item and press TEST BUTTON. The following shows the contents of GAME ASSIGNMENTS

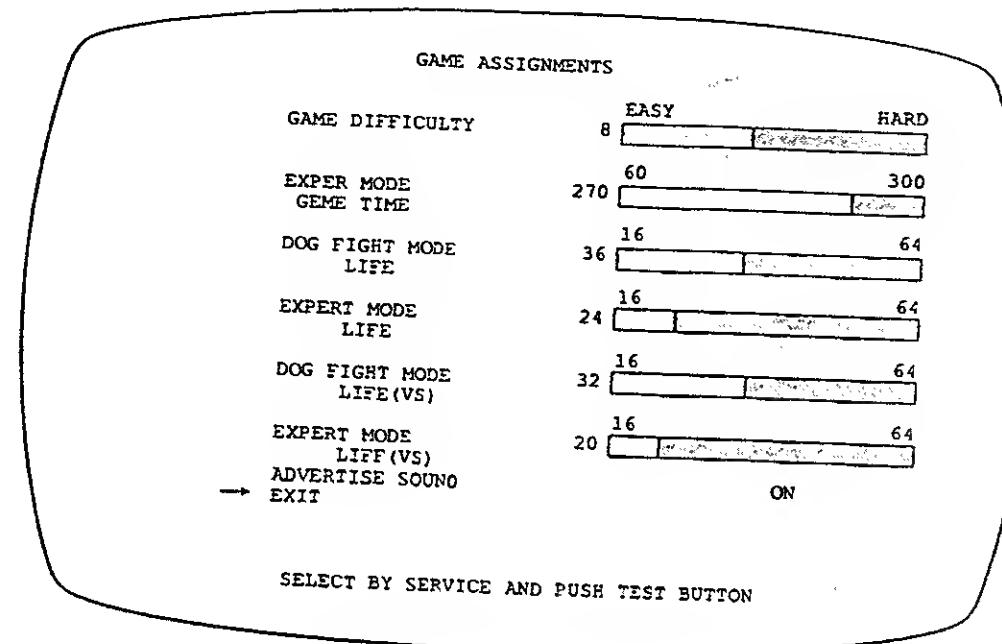


FIG. 8.7 GAME ASSIGNMENTS

- GAME DIFFICULTY: Sets the game difficulty in 1~8 levels. The smaller the numeral is, easier the game will be. Initially, the game difficulty is set to 3.
- EXPERT MODE GAME TIME: Sets per stage timer value in the EXPERT game mode. Set this to 6~300 seconds. Initially it is set to 120 (sec.).
- DOG FIGHT LIFE MODE: Sets the LIFE METER value to 16~64 for the DOG FIGHT mode. Initially, it is set to 36.
- EXPERT LIFE MODE: Sets the LIFE METER value to 16~64 for the EXPERT LIFE mode. Initially, it is set to 24.
- DOG FIGHT LIFE(VS) MODE: Sets the LIFE METER value to 16~64 for the DOG FIGHT vs. mode. Initially, it is set to 32.
- EXPERT LIFE(VS) MODE: Sets the LIFE METER vale to 16~64 for the EXPERT LIFE vs. mode. Initially, it is set to 20.
- ADVERTISE SOUND: ADVERTISE SOUND on/off.
- EXIT: Allows for returning to the menu screen.

## 8-8 COIN ASSIGNMENT

The "COIN ASSIGNMENTS" mode permits you to set the start number of credits, as well as the basic numbers of coins and credits. This mode expresses "how many coins correspond to how many credits."

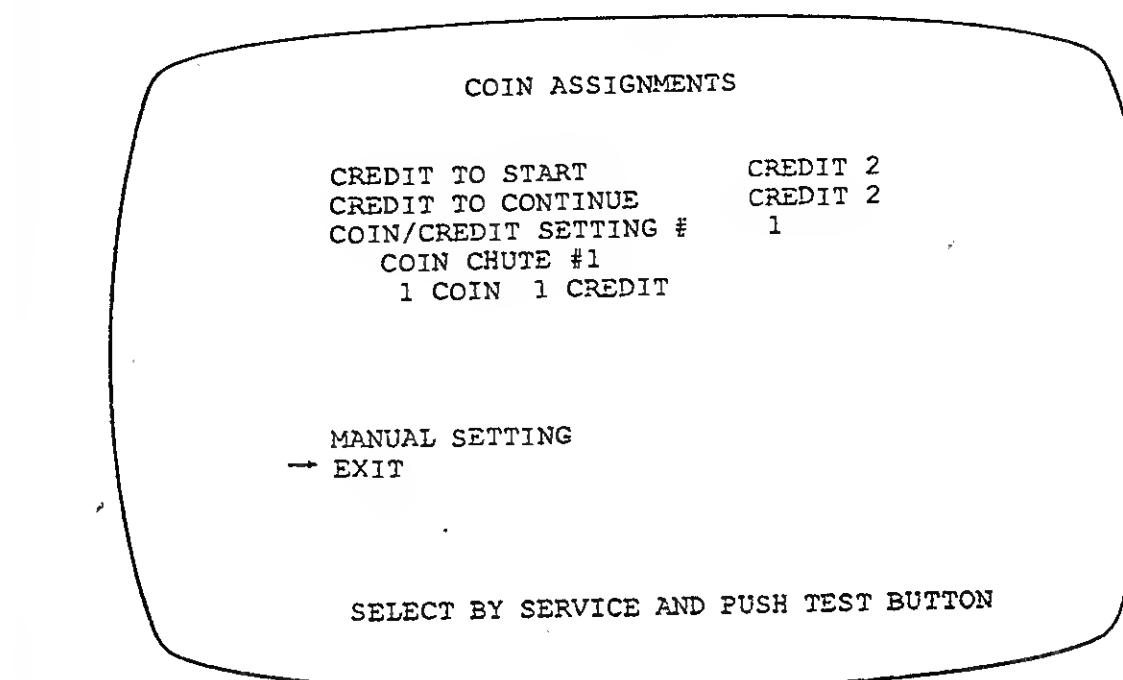
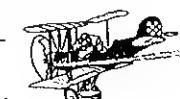


FIG. 8.8a COIN ASSIGNMENT

- **CREDIT TO START:** Number of credits required for starting game (1 ~ 5 credits are selected).  
Initially, it is set to 2.
- **CREDIT TO CONTINUE:** Number of credits required for continuing play (1 ~ 5 are selected).  
Initially, it is set to 2.
- **COIN/CREDIT SETTING:** "How many tokens corresponds to how many credits." In this machine, selection as per Table 8.2 is possible.
- **MANUAL SETTING:** This allows more detailed settings to be made.
- **EXIT:** Allows for returning to the menu screen.



MANUAL SETTING

TABLE 8.2 COIN/CREDIT SETTING

NAME OF SETTING	FUNCTIONING OF COIN CHUTE	
SETTING #1	1 COIN	1 CREDIT
SETTING #6	1 COIN	2 CREDITS
SETTING #8	1 COIN	3 CREDITS
SETTING #9	1 COIN	4 CREDITS
SETTING #10	1 COIN	5 CREDITS
SETTING #11	1 COIN	6 CREDITS
SETTING #12	2 COINS	1 CREDIT
SETTING #15	1 COIN	1 CREDIT
	2 COINS	3 CREDITS
SETTING #17	3 COINS	1 CREDIT
SETTING #18	4 COINS	1 CREDIT
SETTING #19	1 COIN	1 CREDIT
	2 COINS	2 CREDITS
	3 COINS	3 CREDITS
	4 COINS	5 CREDITS
SETTING #21	3 COINS	1 CREDIT
	5 COINS	2 CREDITS
SETTING #22	2 COINS	1 CREDIT
	4 COINS	2 CREDITS
	5 COINS	3 CREDITS
SETTING #24	1 COIN	1 CREDIT
	2 COINS	2 CREDITS
	3 COINS	3 CREDITS
	4 COINS	4 CREDITS
	5 COINS	6 CREDITS
SETTING #26	FREE PLAY	

COIN ASSIGNMENTS  
MANUAL SETTING

COIN TO CREDIT  
BONUS ADDER

1 COIN 1 CREDIT  
NO BONUS ADDER

COIN CHUTE #1 MULTIPLIER

1 COIN COUNT AS 1 COIN  
COIN 1 2 3 4 5 6 7 8 9  
CREDIT 1 2 3 4 5 6 7 8 9

-- EXIT

SELECT BY SERVICE AND PUSH TEST BUTTON

FIG. 8.8b COIN ASSIGNMENTS

- COIN TO CREDIT: Determines COIN/CREDIT setting.
- BONUS ADDER: This sets how many COINS should be inserted to obtain one SERVICE COIN.
- 1 COIN COUNT AS 1 COIN: This sets how many tokens one COIN represents.

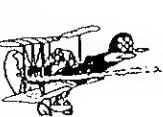


TABLE 8.3 MANUAL SETTING

COIN TO CREDIT	1 COIN 1 CREDIT
	2 COINS 1 CREDIT
	3 COINS 1 CREDIT
	4 COINS 1 CREDIT
	5 COINS 1 CREDIT
	6 COINS 1 CREDIT
	7 COINS 1 CREDIT
	8 COINS 1 CREDIT
	9 COINS 1 CREDIT

BONUS ADDER	NO BONUS ADDER
	2 COINS GIVE 1 EXTRA COIN
	3 COINS GIVE 1 EXTRA COIN
	4 COINS GIVE 1 EXTRA COIN
	5 COINS GIVE 1 EXTRA COIN
	6 COINS GIVE 1 EXTRA COIN
	7 COINS GIVE 1 EXTRA COIN
	8 COINS GIVE 1 EXTRA COIN
	9 COINS GIVE 1 EXTRA COIN

COIN CHUTE MULTIPLIER	1 COIN COUNTS AS 1 COIN
	1 COIN COUNTS AS 2 COINS
	1 COIN COUNTS AS 3 COINS
	1 COIN COUNTS AS 4 COINS
	1 COIN COUNTS AS 5 COINS
	1 COIN COUNTS AS 6 COINS
	1 COIN COUNTS AS 7 COINS
	1 COIN COUNTS AS 8 COINS
	1 COIN COUNTS AS 9 COINS

## 8-9 BOOKKEEPING

Selecting the BOOKKEEPING in the menu mode causes the bookkeeping data up to the present to be displayed on 3 pages.

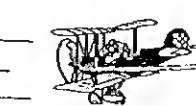
BOOKKEEPING COIN REPORT		PAGE 1/3
COIN CHUTE	0	
COIN CREDITS	0	
SERVICE CREDITS	0	
TOTAL CREDITS	0	
NUMBER OF GAMES	0	
NUMBER OF CONTINUE	0	

PUSH TEST BUTTON TO CONTINUE

FIG. 8.9 a BOOKKEEPING

- COIN CHUTE: Number of tokens put in the coin chute.
- COIN CREDITS: Number of credits registered by inserting coins
- SERVICE CREDITS: Credits registered by the SERVICE BUTTON
- TOTAL CREDITS: Total number of credits (COIN CREDITS+SERVICE CREDITS)
- NUMBER OF GAMES: Each seat's total games
- NUMBER OF CONTINUE: Each seat's total continue play

● Press the TEST BUTTON to proceed to the following page (2/3).



TOTAL TIME 0000H00M00S  
GAME PLAY TIME 0000H00M00S  
LONGEST GAME TIME 0000H00M00S  
SHORTEST GAME TIME 0000H00M00S

TIME HISTOGRAM  
0-29 0  
30-59 0  
60-119 0  
120-179 0  
180-239 0  
240-299 0  
300 OVER

PUSH TEST BUTTON TO CONTINUE

FIG. 8.9 b BOOKKEEPING

- TOTAL TIME: The total energized time
- GAME PLAY TIME: Each seat's total game time
- LONGEST GAME TIME: Each seat's longest game time
- SHORTEST GAME TIME: Each seat's shortest game time
- Press the TEST BUTTON to proceed to the following page (3/3).

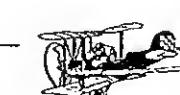
DOG FIGHT GAME 0  
EXPERT GAME 0  
1PLAYER GAME 0  
2PLAYER GAME 0  
INTRUDE GAME 0  
INTRUDED GAME 0  
  
STAGE 1 0  
STAGE 2 0  
STAGE 3 0  
STAGE 4 0

PUSH TEST BUTTON TO EXIT

FIG. 8.9 c BOOKKEEPING

- DOG FIGHT GAME: Frequency of play in DOG FIGHT game mode
- EXPERT GAME: Frequency of play in EXPERT game mode
- 1PLAYER GAME: Frequency of 1 PLAYER GAME play
- 2PLAYER GAME: Frequency of 2 PLAYER GAME play
- INTRUDE GAME: Frequency of break-in by you (during game play)
- INTRUDED GAME: Frequency of break in by the opponent
- STAGE 1: Frequency of play in STAGE 1
- STAGE 2: Frequency of play in STAGE 2
- STAGE 3: Frequency of play in STAGE 3
- STAGE 4: Frequency of play in STAGE 4

- Press the TEST BUTTON to proceed to the menu mode.



#### 8-10 BACKUP DATA CLEAR

Clears the contents of BOOKKEEPING.

When clearing, bring "→" to "YES" and press the TEST BUTTON.

When the data has been cleared, "COMPLETED" will be displayed. Bring "→" to "NO" and press the TEST BUTTON to cause the Menu mode to return on to the screen.

Also, note that the game setting contents are not affected by BACKUP DATA CLEAR operation.

BACKUP DATA CLEAR

→ YES ( CLEAR )  
→ NO ( CANCEL )

SELECT BY SERVICE AND PUSH TEST BUTTON

FIG. 8.10 BACKUP DATA CLEAR

#### 8-11 OUTPUT TEST

In the following display, bring the arrow mark by using the SERVICE BUTTON and perform the lamp ON/OFF test by pressing the TEST BUTTON.

OUTPUT TEST

START BUTTON OFF  
VIEW SELECTOR 1 OFF  
VIEW SELECTOR 2 OFF  
VIEW SELECTOR 3 OFF  
VIEW SELECTOR 4 OFF  
→ EXIT

SELECT BY SERVICE AND PUSH TEST BUTTON

FIG. 8.11 OUTPUT TEST

- START: START LAMP ON/OFF
- VIEW SELECTOR 1: VIEW SELECTOR 1 LAMP ON/OFF
- VIEW SELECTOR 2: VIEW SELECTOR 2 LAMP ON/OFF
- VIEW SELECTOR 3: VIEW SELECTOR 3 LAMP ON/OFF
- VIEW SELECTOR 4: VIEW SELECTOR 4 LAMP ON/OFF
- EXIT: Allows for returning back to the menu mode.



MAX. AND MIN. values are set in the following procedure:

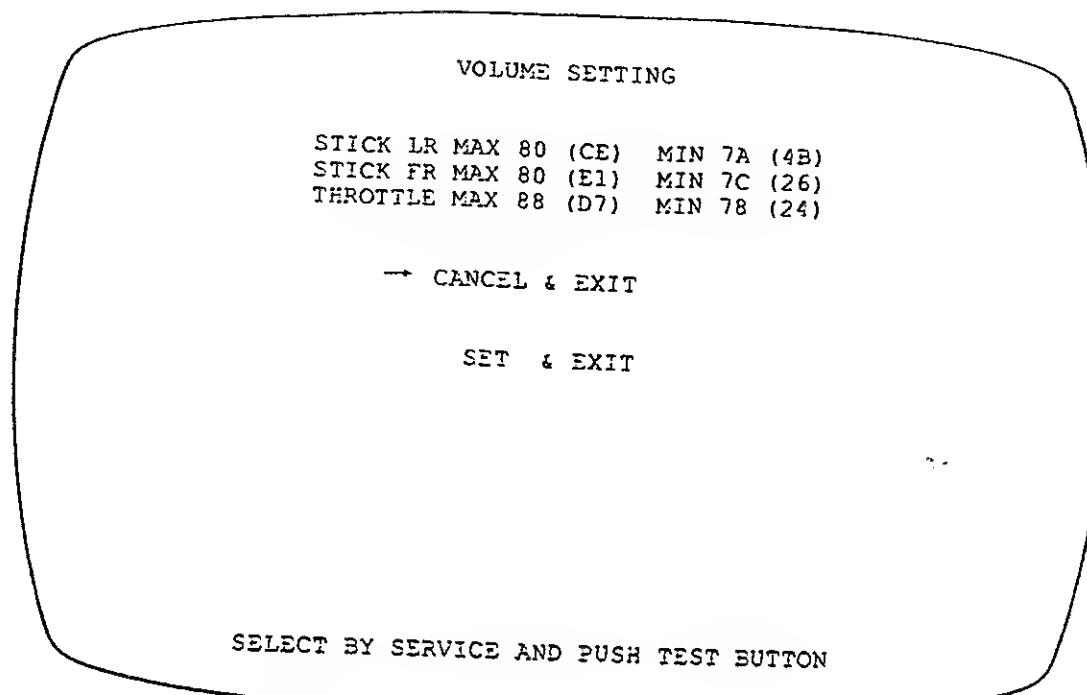


FIG. 8.12 VOLUME SETTING

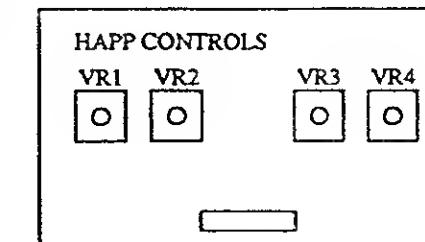
- ① Input all the V.R.'s (at the right /left, forward/backward positions of the stick, and forward/backward positions of the throttle lever) to the extreme ends.
- ② By using the SERVICE BUTTON, bring the arrow mark to SET & EXIT and press the TEST BUTTON for V.R. setting.
- ③ When setting change is not intended, bring the arrow mark to CANCEL & EXIT by using the SERVICE BUTTON and press the TEST BUTTON to return back to the menu mode.
- ④ Even when the stick is moved, if the V.R. value is not within the following range, make adjustments by using the procedure below.

● STICK LR: (at the right and left of the stick)	MAX D0~EF (**)	MAX D0~EF (**)
● STICK FR: (in the front and back of the stick)	MAX D0~EF (**)	MAX D0~EF (**)
● THROTTLE: (in the front and back of the throttle lever)	MAX D0~EF (**)	MAX 20~3F (**)

Note: (\*) indicates the previous setting

AMP BOARD

By referring to 9-1, open the control panel, and the AMP BOARD will appear on the reverse side of the controller.



- VR1 : Centering the STICK FR (front and back)
- VR2 : AMP ratio of STICK FR  
(becomes greater clockwise).
- VR3 : AMP ratio of STICK LR (left and right)  
(becomes greater clockwise).
- VR4 : Centering the STICK LR

## ADJUSTMENT METHOD

- ① Enter the INPUT TEST.
- ② Make adjustments by turning the AMP BD's VR1 and VR 4 in the manner so that the values of STICK LR and FR become 80H.
- ③ Make adjustments by gradually turning VR2 and VR3 in the manner so that when the stick is inclined to the front/back, and left/right, the values obtained are in the above VOLUME setting range.
- ④ Enter the VOLUME SETTING mode, bring the arrow mark to SET & EXIT, and press the TEST BUTTON to have the setting recorded.

## 8-13 COMMUNICATION SETTING

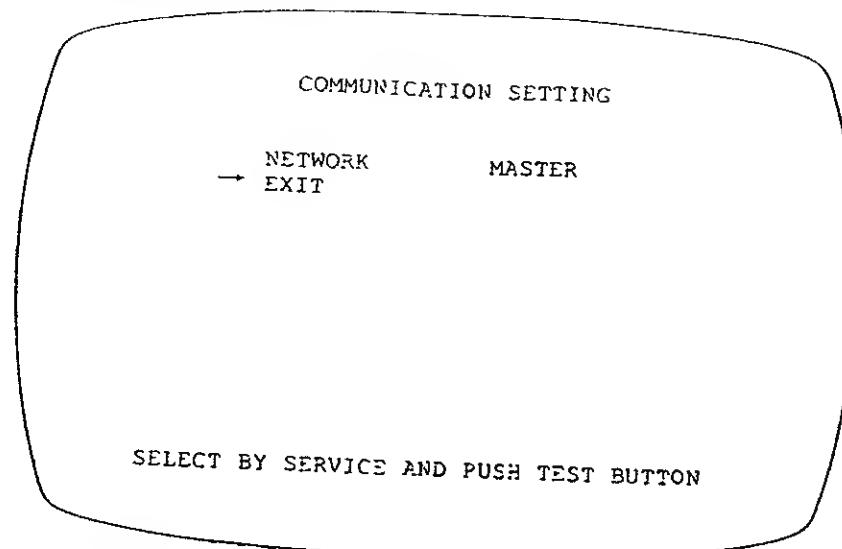


FIG. 8.13 COMMUNICATION SETTING

Herein, communication related matters are set. When using the game, make sure that one of the following is set:

### ● WHEN USED AS TWIN CABINET:

- ① For both left and right cabinets, bring the arrow mark to NET WORK by using the SERVICE BUTTON.
- ② Set the left cabinet to "MASTER" by pressing the TEST BUTTON.
- ③ SET the right -hand side cabinet to "SLAVE" by pressing the TEST BUTTON.
- ④ For both (left/right) cabinets, bring the arrow mark to EXIT by using the SERVICE BUTTON and press the TEST BUTTON to return back to the menu mode.

### ● WHEN USED AS SINGLE CABINET:

- ① Bring the arrow mark to NETWORK by using the SERVICE BUTTON.
- ② Press the TEST BUTTON to have STAND ALONE appear.
- ③ Bring the arrow mark to EXIT by using the SERVICE BUTTON to return back to the menu mode.

#### CAUTION!

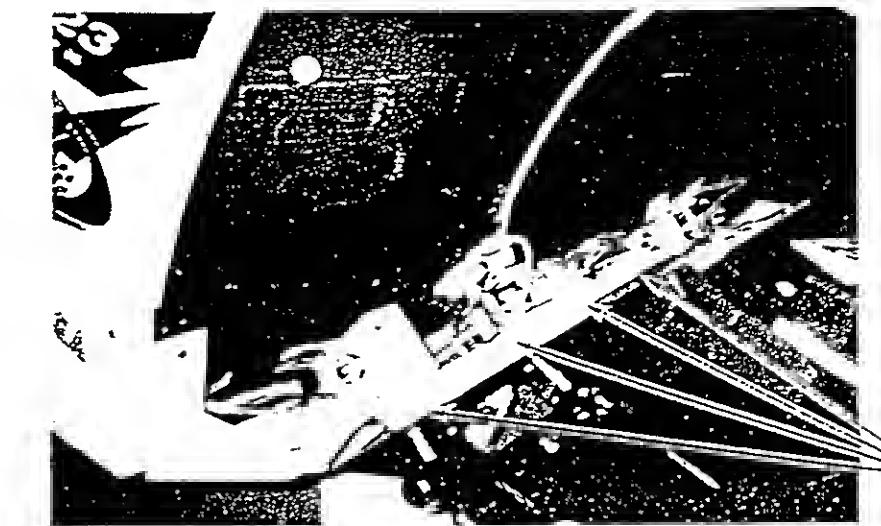
When set to TWIN cabinet, changing the setting of the MASTER cabinet's COIN ASSIGNMENTS and GAME ASSIGNMENTS automatically results in the same contents being copied and set for the SLAVE cabinet. Therefore, setting these by the MASTER unit only will be sufficient (separate setting for both machines is not possible).



## 9. CONTROL PANEL

### 9-1 OPENING THE CONTROL PANEL

Take off the 4 truss screws from the control panel as shown, and open the control panel.



TRUSS SCREWS (4)  
M3×16, using flat washers

FIG. 9.1

### 9-2 V. R. REPLACEMENT

When replacing the V. R., remove the CONTROLLER.

- ① Take off the 4 screws (which secure the control panel) to open the control panel.
- ② Disconnect the 3 CONNECTORS.
- ③ Remove the 4 hexagon nuts and carefully pull out the CONTROLLER.
- ④ Take off the 4 TAPPING SCREWS to remove the V. R.

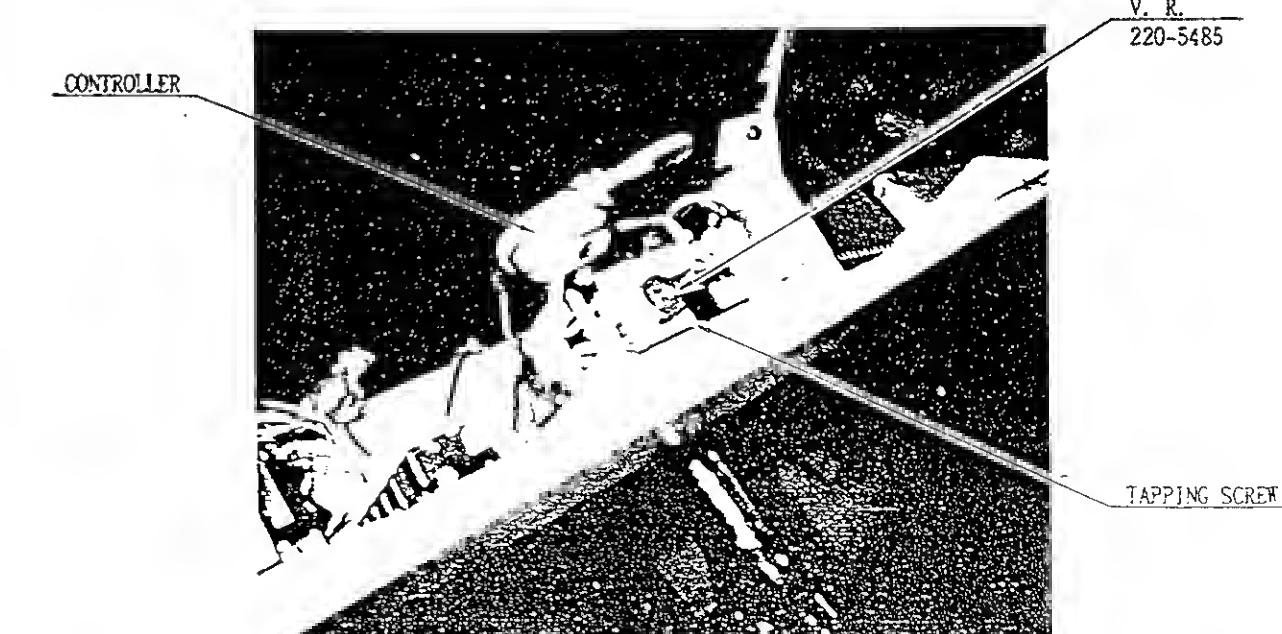


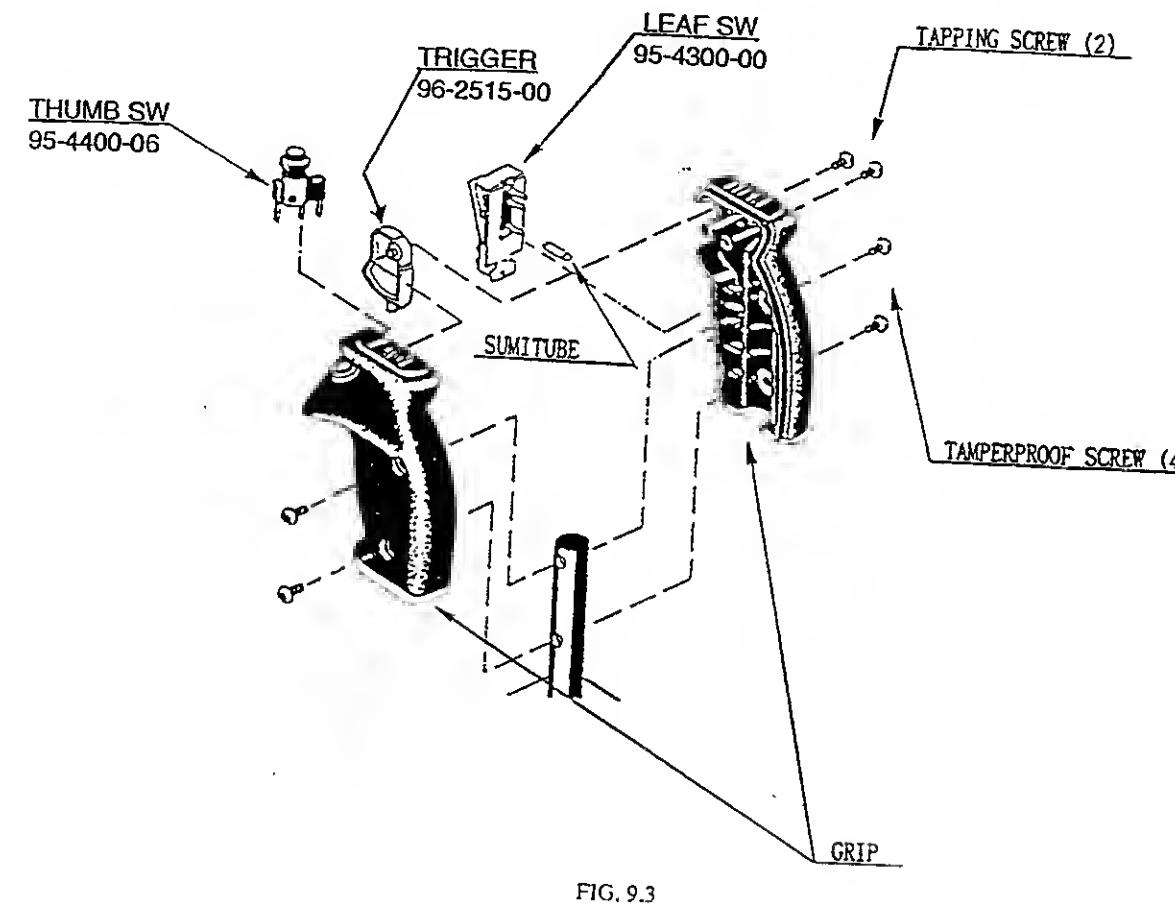
FIG. 9.2



### 9-3 SWITCH REPLACEMENT

When the GUN TRIGGER and MISSILE TRIGGER are pressed, if the MACHINE GUN & MISSILE displays are not ON in the INPUT TEST mode, the switches may be malfunctioning. In this case, the switches need to be replaced.

- ① Remove the 2 TAPPING SCREWS and the 4 TAMPERPROOF SCREWS to disassemble the GRIP.
- ② In this status, each switch can be replaced. The GUN TRIGGER replaces the following LEAF switch, and the MISSILE TRIGGER SW replaces the THUMB switch.



### 9-4 GREASING

Apply grease to the shaft mobile part once every 3 months (see FIG. 9.2).

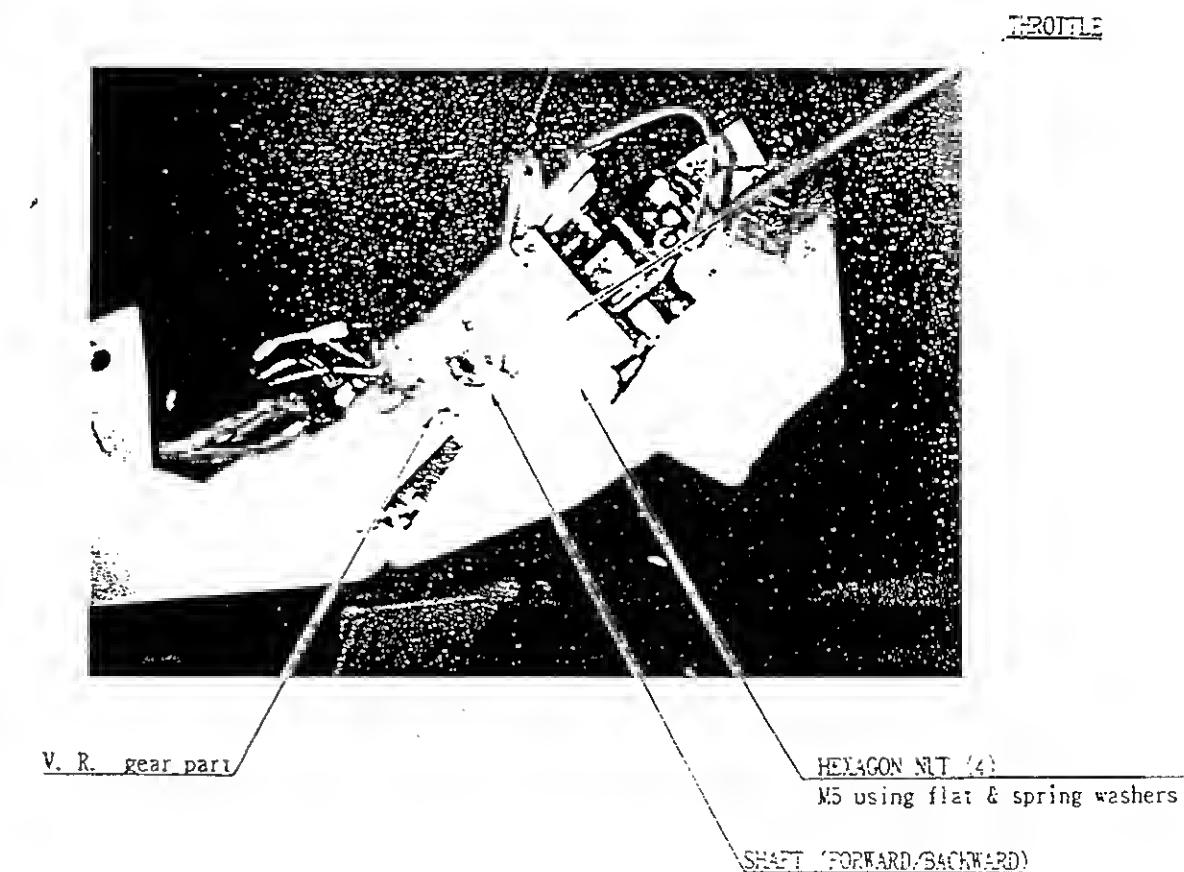
## 10. THROTTLE

In the TEST mode, if adjustments can not be made in a manner to ensure that the THROTTLE's V. R. value variations are within the allowable range, then it is necessary to adjust the V. R. installation position or to replace the V. R.

Also, be sure to apply grease to the mechanism part once every 3 months. To perform the above work, remove the THROTTLE from the cabinet.

### 10-1 REMOVING THE THROTTLE

- ① Open the CONTROL PANEL as in 9-1 above.
- ② Disconnect the CONNECTOR.
- ③ Take off the 4 hexagon nuts and carefully pull out the THROTTLE.



## 10-2 ADJUSTMENT AND REPLACEMENT OF VOLUME

### ADJUSTING THE VR

- ① Make the VR BRACKET movable by loosening its SCREWS "A".
- ② Move the VR BRACKET until the VR GEAR is disengaged from the ADJUST GEAR. Rotate the VR shaft so that the value displayed on screen is within the tolerance.
- ③ Cause the gears to be engaged and tighten SCREWS "A." Backlash should be adjusted at this moment.
- ④ If fine adjustment is necessary, loosen the SCREWS "B" and rotate the ADJUST GEAR until the desired value is attained.
- ⑤ After making adjustments, newly set the VR value in the TEST mode.

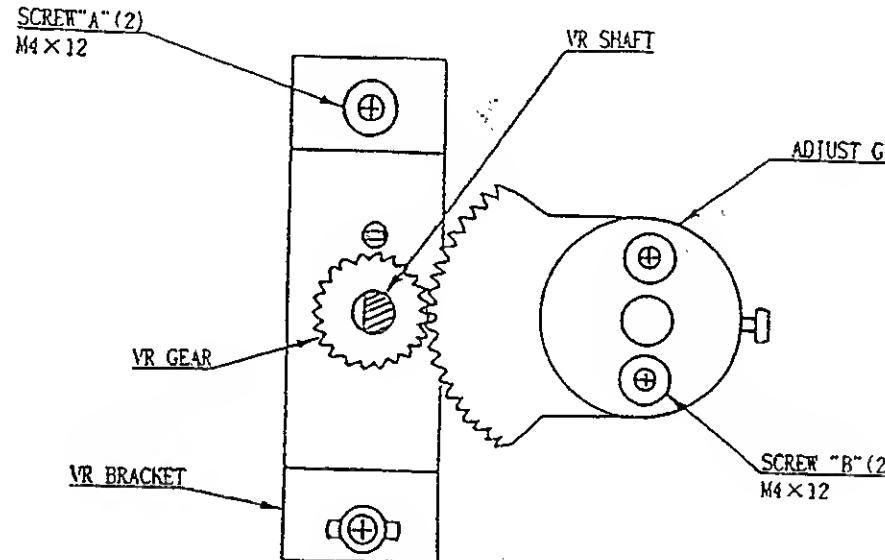


FIG. 10.2 VR ADJUSTMENT

### REPLACEMENT OF VOLUME (220-5130 or -5373 VOL CONT B-5K OHM)

- ① Remove the SCREWS "A" that fasten the VR BRACKET. The VR BRACKET becomes unfastened and the VR GEAR disengaged from the ADJUST GEAR.
- ② Remove the VR GEAR from the VR. Then, replace the VR.
- ③ After the replacement of the VR, newly set the VR value in the VOLUME ADJUSTMENT mode.

## 10-3 GREASING

Apply grease to the SHAFT (FORWARD/BACKWARD) and V. R. gear part once every 3 months (see FIG. 10-1).

## 11. COIN SELECTOR

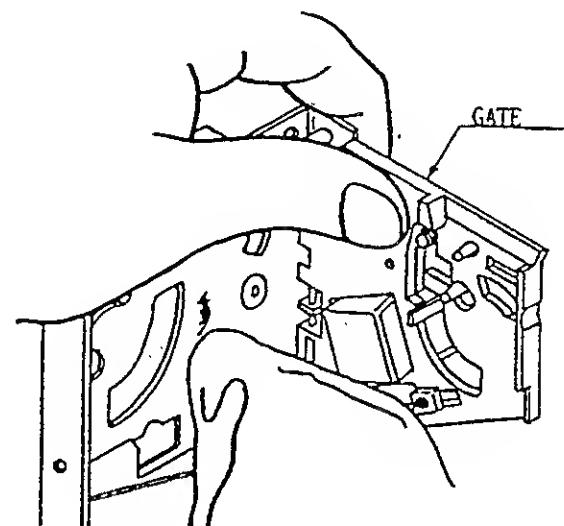
### HANDLING THE COIN JAM

Even when the REJECT button is pressed, if the coin is not rejected, open the coin chute door and open the selector gate. After removing the jammed coin, put a normal coin in and check to see that the selector correctly functions.

### CLEANING THE COIN SELECTOR

The coin selector should be cleaned once every 3 months. When cleaning, follow the procedure below:

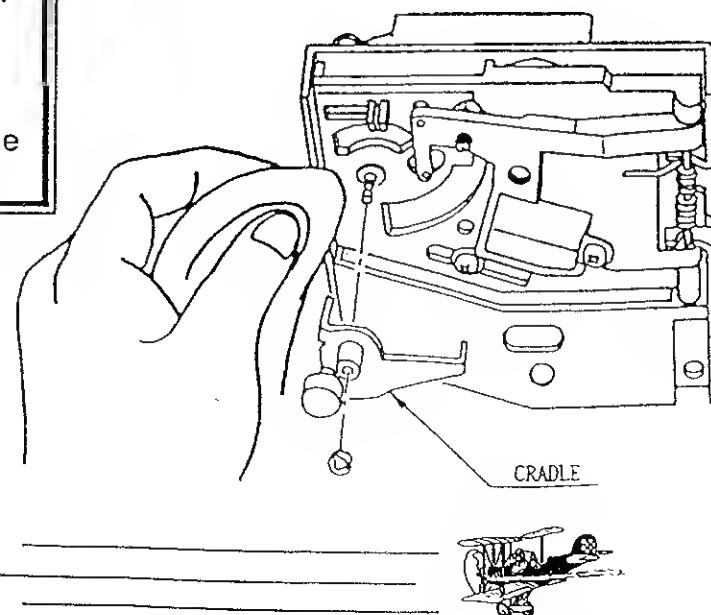
- ① Turn the power for the machine OFF. Open the coin chute door.
- ② Open the gate and dust off by using a soft brush (made of wool, etc.).
- ③ Remove stain by wiping with a soft cloth which contains water or chemical detergent.
- ④ Remove the CRADLE. When removing the retaining ring (E ring), be very careful so as not to bend the shaft.
- ⑤ Remove stain from the shaft and pillow portions by wiping off with a soft cloth, etc.
- ⑥ After wiping off as per 5 above, further apply a dry cloth, etc. to cause the coin selector to dry completely.



### NOTE:

Absolutely do not apply machine oil, etc. to the coin selector.

After cleaning the coin selector, insert a regular coin in the normal working status and ascertain that the selector correctly functions.



## 12. MONITOR ADJUSTMENTS

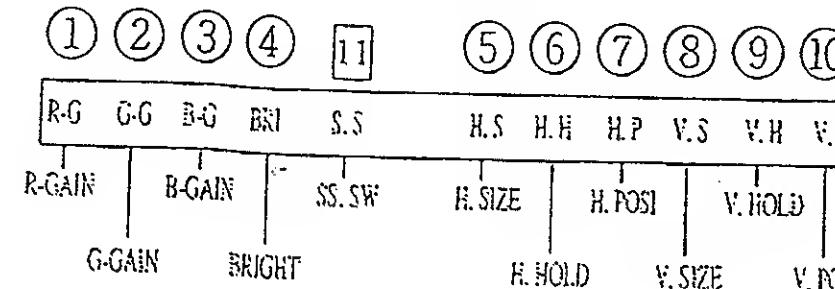
### CAUTION!

- Do not operate the ADJUSTMENT knobs without good reason.
- A certain portion of the monitor is subject to a high voltage and therefore be very careful of this point.
- When making adjustment, utilize a resinous Alignment Screwdriver.

Remove LID A on rear of cabinet to make the monitor adjustments (refer to 9.3).

NANAO monitor: 24K mode

Model: MS 8-2654  
2001-5187-15



- ① R-GAIN
- ② G-GAIN .....Controls colors.
- ③ B-GAIN
- ④ BRIGHT .....Controls horizontal brightness.
- ⑤ H. SIZE .....Controls horizontal screen size.
- ⑥ H. HOLD .....Provides horizontal synchronization, i.e., controls right/left blurring of image.
- ⑦ H. POSI .....Controls horizontal display position on screen.
- ⑧ V. SIZE .....Controls vertical screen size.
- ⑨ V. HOLD .....Provides vertical synchronization, i.e., controls up-down scrolling of image.
- ⑩ V. POSI .....Controls vertical display position on screen
- ⑪ H. POSI .....Controls the visual quality. (Only applies to Nanao.)

A: Ordinary    B: Super-sharpness

## 13. REPLACING THE FLUORESCENT LAMP, AND LAMPS

In a manner as shown below, remove the parts and replace the fluorescent lamp.

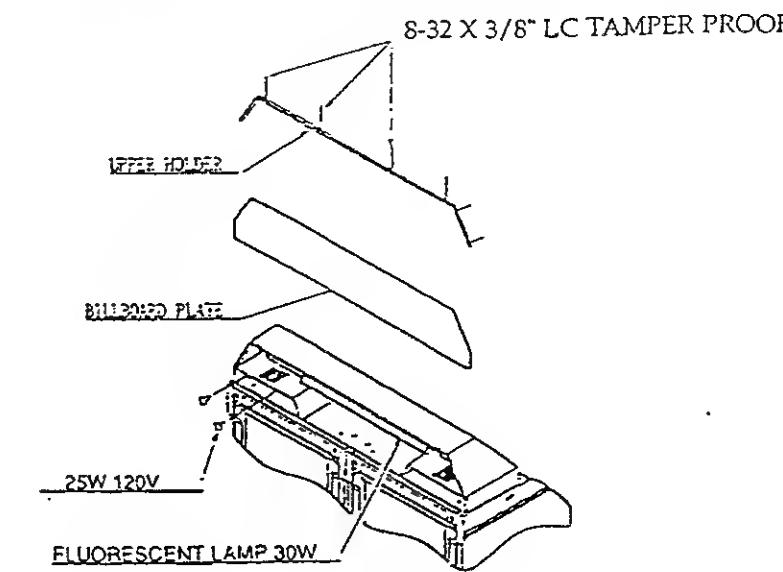


FIG. 14

## 14. PERIODIC CHECK

The items listed below require periodic check and maintenance to retain the performance of this machine and to ensure safe business operation.

	Item	Interval	Reference
CONTROL PANEL	Check VOLUME VALUE.	Monthly	8
	Greasing of GEAR and bearing.	Trimonthly	9
THROTTLE	Check VOLUME VALUE.	Monthly	8, 10
	Greasing of GEAR and bearing.	Trimonthly	10
COIN CHUTE TOWER	Check COIN SW.	Monthly	8
	Cleaning of COIN SELECTOR.	Trimonthly	11
MONITOR	Check adjustments.	Monthly	6, 8, 12
SEAT	Antistatic measures	Bimonthly	5
GAME BD	MEMORY TEST.	Monthly	8
	Check settings.	Monthly	8



## 15. TROUBLESHOOTING

In case a problem occurs, first check wiring connector connections.

PROBLEMS	CAUSE	COUNTERMEASURES
When the main SW is turned ON, the machine is not activated.	The power is not ON. Incorrect power source/voltage.	Firmly insert the plug into the outlet. Make sure that the power supply/voltage are correct.
MONITOR screen is blackened and the fluorescent lamp does not light up.	Power supply unit fuse blown due to instantaneous overcurrent.	First remove the cause of overcurrent, then replace the fuse (refer to Sec.16). 514-5036-7000 FUSE 10 A 250V
MONITOR screen is all blue.	Defective connections in between each board.	Make sure of correct connections in between each board.
The color of image on MONITOR screen is incorrect.	Incorrect monitor adjustment.	Make appropriate adjustments (see Sec. 8).
The on-screen image of the monitor sways and or shrinks.	The power source and voltage are not correct.	Make sure that the power supply and voltage are correct.
Control panel and pedal not operable satisfactorily.	V. R. position deviated, or V. R. malfunctioning. ADJUST GEAR's engagement is not correct.	Adjust or replace the V. R. (see Sec. 9 & 10). Adjust the engagement of ADJUST GEAR (see Sec. 10).
MACHINE GUN & MISSILE firing operation is not satisfactory	SW malfunctioning	SW replacement (refer to 9-3). GUN TRIGGER Parts No. 509-5457 MISSILE TRIGGER Parts No. 509-5458
Fluorescent lamp doesn't light up.	Fluorescent lamp needs replacement. The connector is disconnected.	Replace the fluorescent lamp (see Sec. 13). Check connector connections in the roof (see Sec. 6)
Interactive play is not possible.	Communication cable is disconnected. Cable connections are not correct. Settings for communication play are not correct.	Connect the cable. Connect the cable correctly (see Sec. 6). Ensure that COMMUNICATION SETTING settings are correct (see Sec. 8).
Sound is not emitted.	Sound volume adjustment is not correct. Malfunctioning of sound BD and memory.	Adjust the SWITCH UNIT's sound adjustment volume (control) (see Sec. 8). Perform SOUND TEST(see Sec. 8).

## 16. GAME BOARD

### 16-1 REMOVING THE BOARD

To replace the IC BD (such as GAME BD, DRIVE BD, etc.) take out the IC BD by using the following procedure:

- ① Turn the MAIN SW off.
- ② Unlock and take off the 2 truss screws from the side of the base as shown.
- ③ Turn the knob to unlock. The seat can be inclined in the direction shown. When inclining the seat, be careful so as not to damage the seat parts. Carefully cause the backrest portion of the seat to come into contact with the floor. If the floor has hard surfaces, protect the seat from damage by using a cloth, etc. on the floor surfaces.
- ④ Take off the 3 screws to remove the case lid. The GAME BD and I/O BD are incorporated in the shield case.
- ⑤ Take off a total of 4 screws from both sides with the seat being in an inclined status. Removing BASE LID F allows the power supply unit and SOUND BD to be checked.

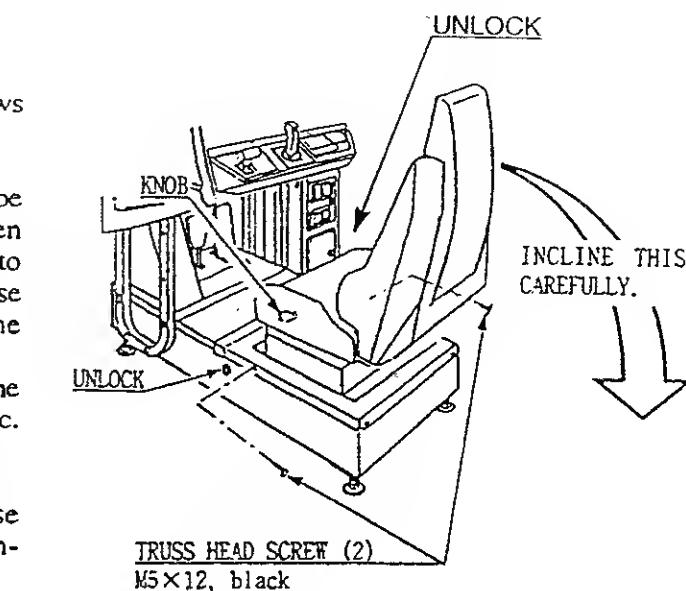


FIG. 16. 1

Fuses are placed in the power supply.

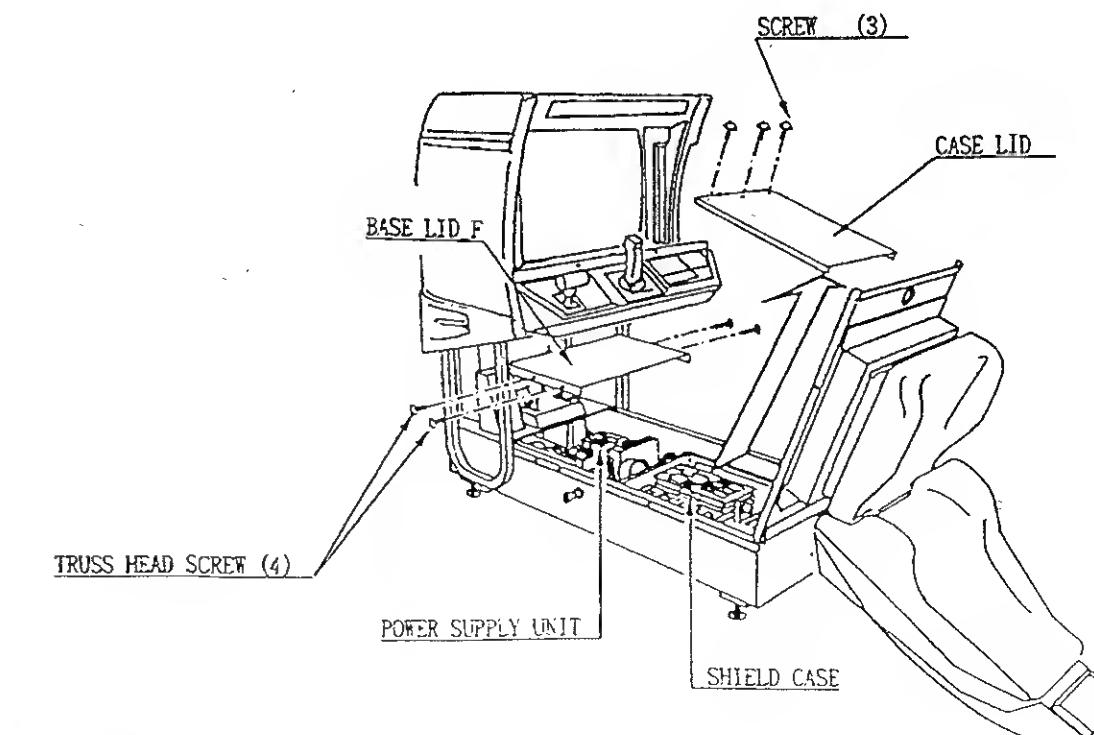
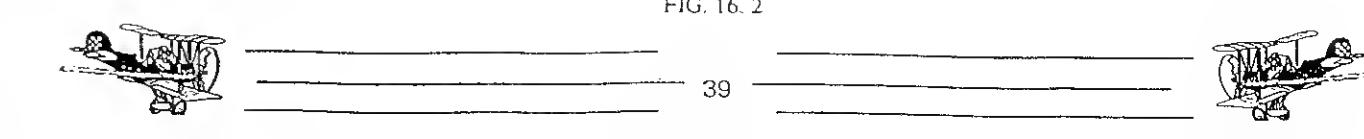
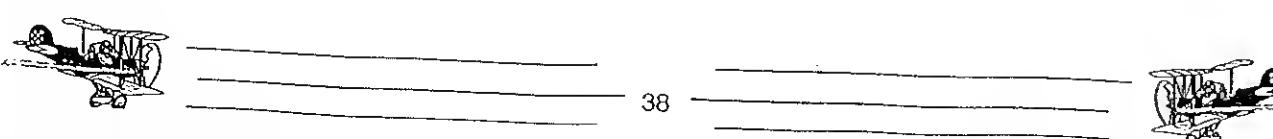
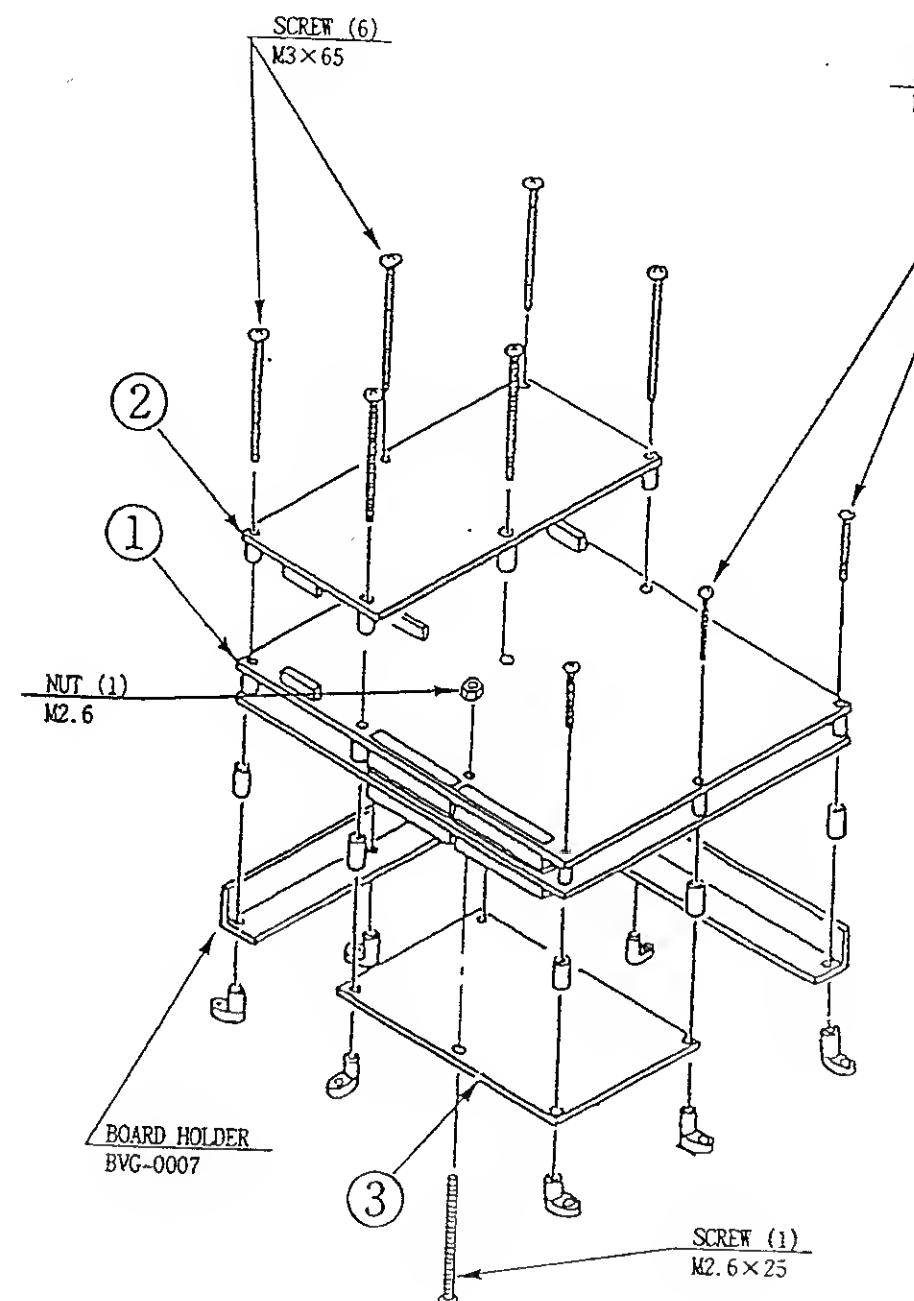


FIG. 16. 2

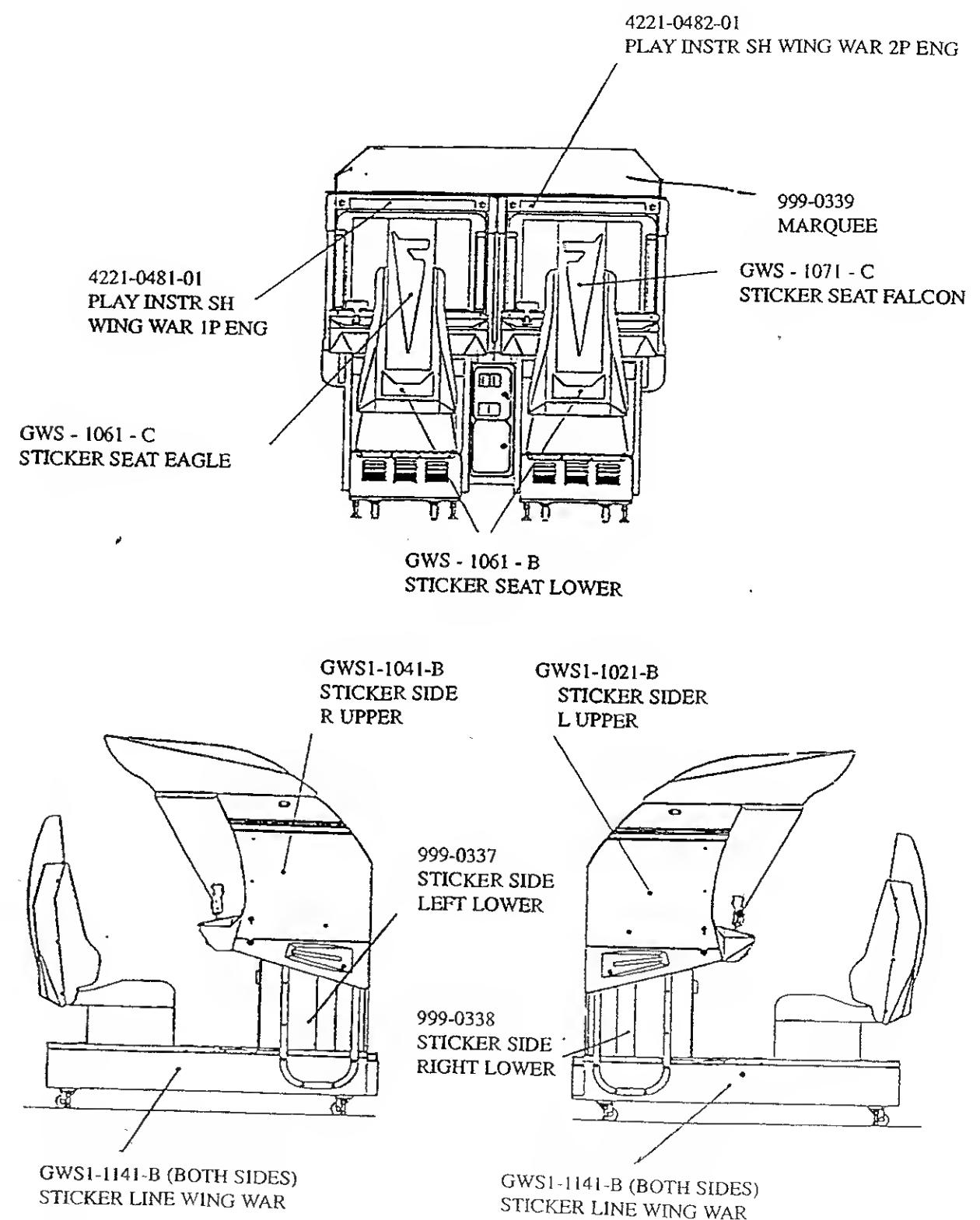


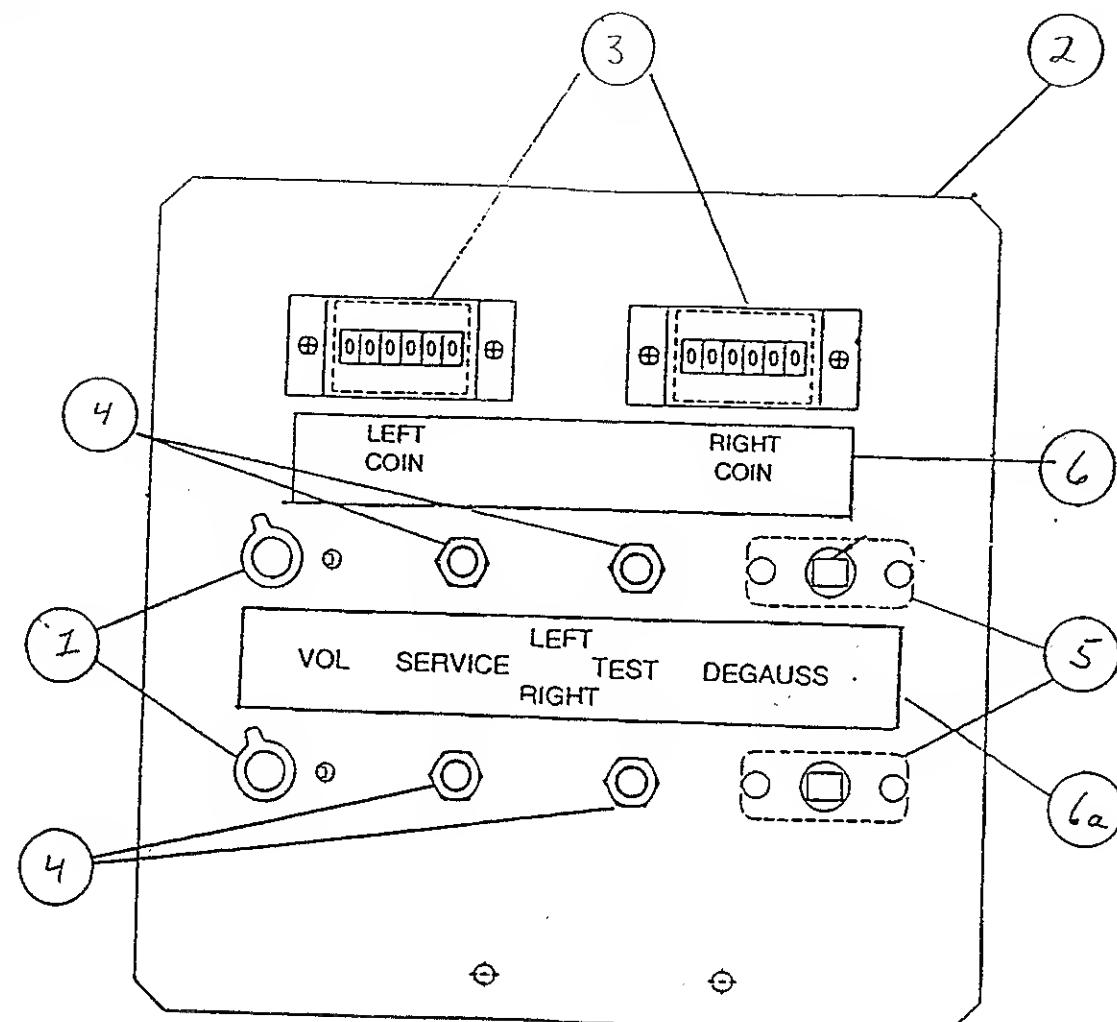
## 16-2 COMPOSITION OF GAME BOARD



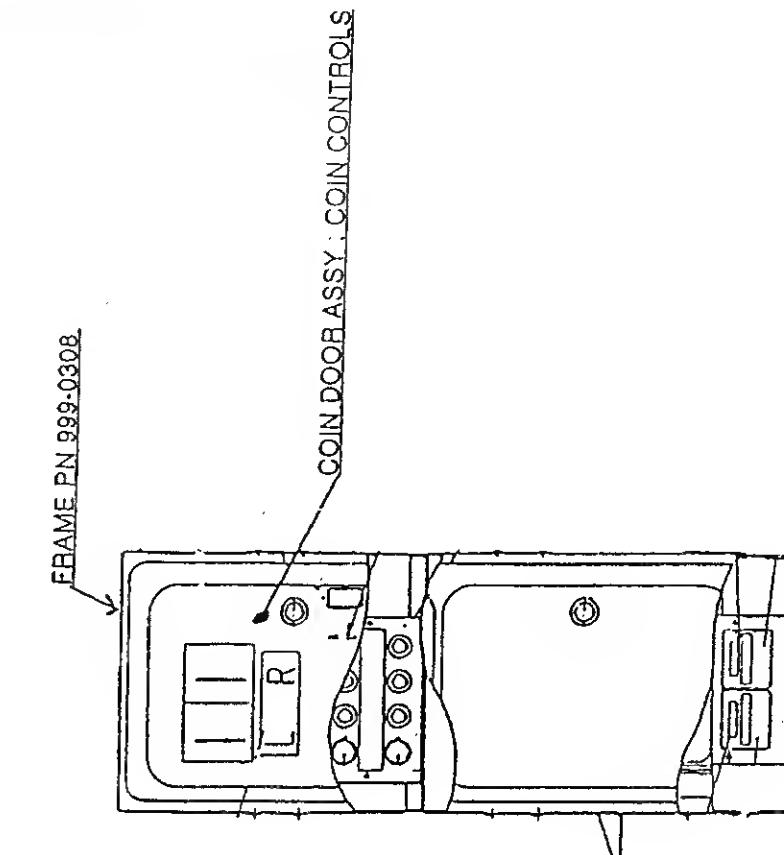
GAME BD No. 833-10844-01

## 17. DESIGN RELATED PARTS

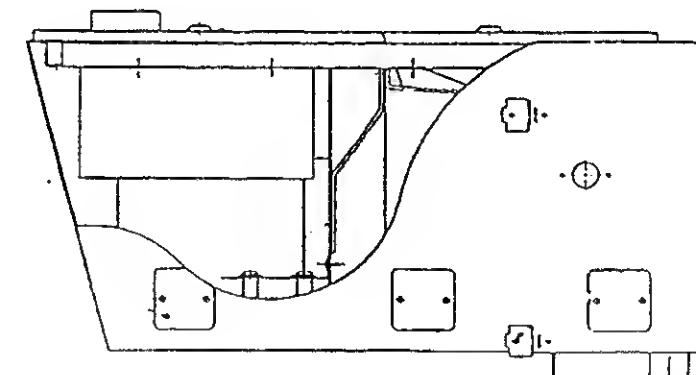




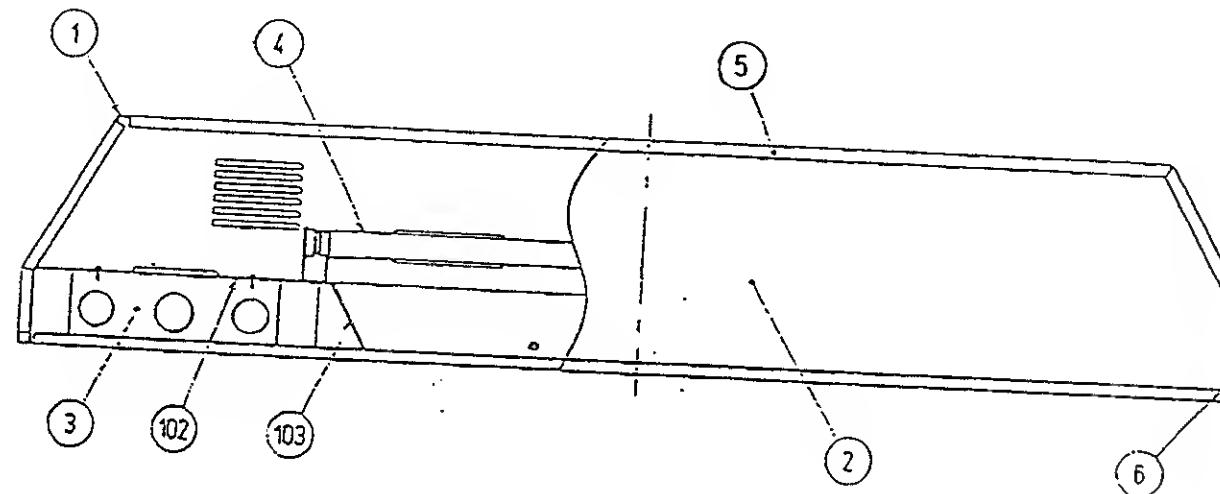
ITEM	PART NUMBER	DESCRIPTION
1		5 k Volume Pot
2		Bracket
3		Coin Meter (6VDC, No Diode, No Light)
4		Push Button Switch
5		3A Push Button Switch
6		Label 1
7		Label 2



FIBER OPTICS LINK

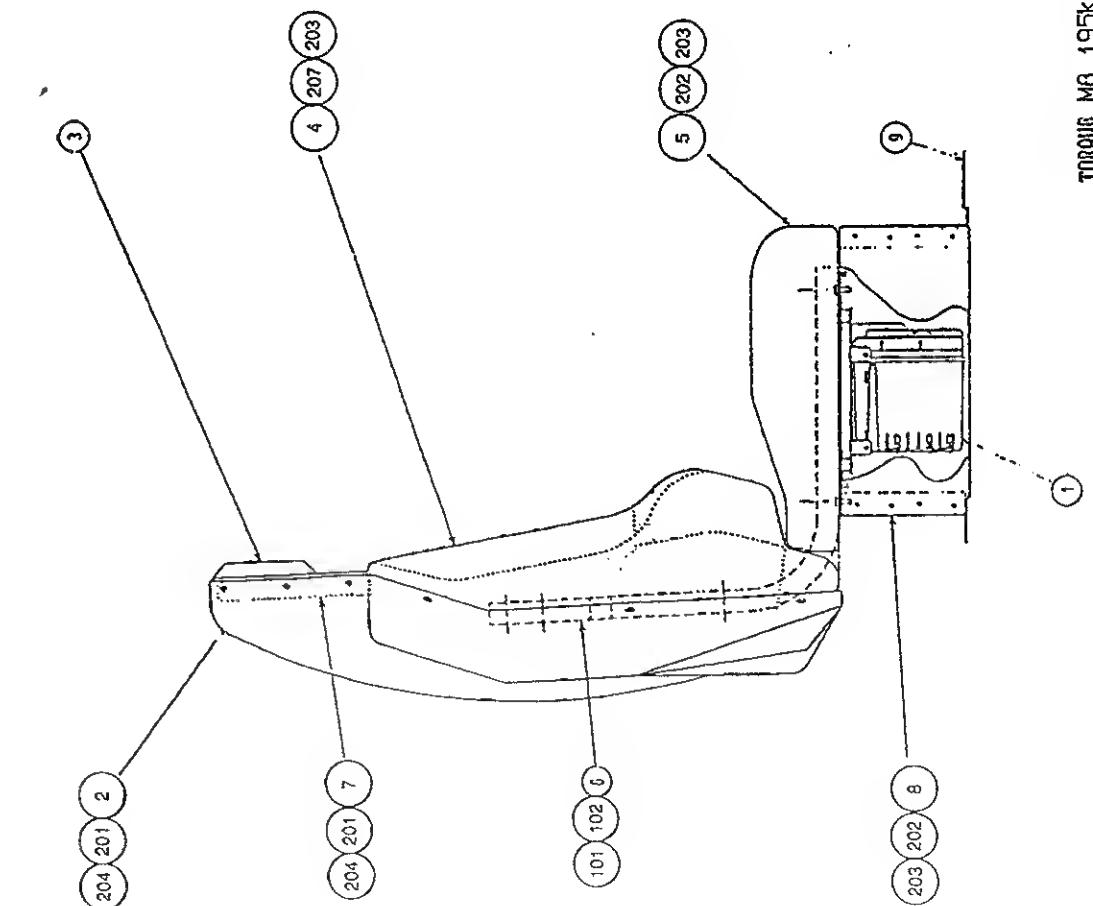
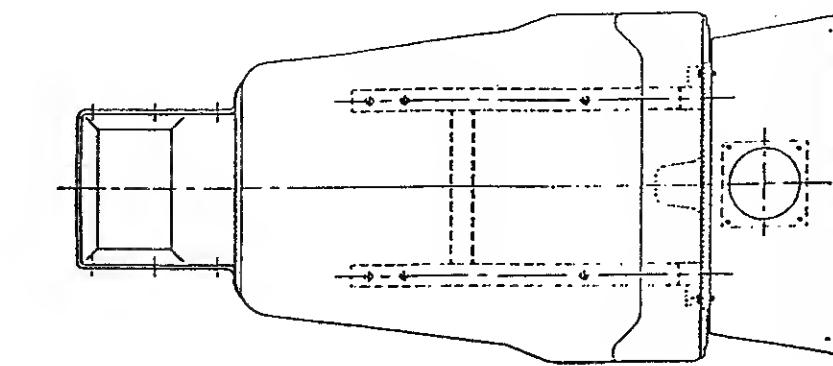


② ASSY BILLBOARD



ITEM	PART NUMBER	DESCRIPTION
1	DYN1-0201	BILLBOARD CASE
2	999-0339	BILLBOARD PLATE
3		LAMP UNIT
4		FL UNIT 30W
5	DYN1-0203	UPPER HOLDER
6	DYN1-0204	SIDE HOLDER
		INCANDESCENT BULB 25W 120V

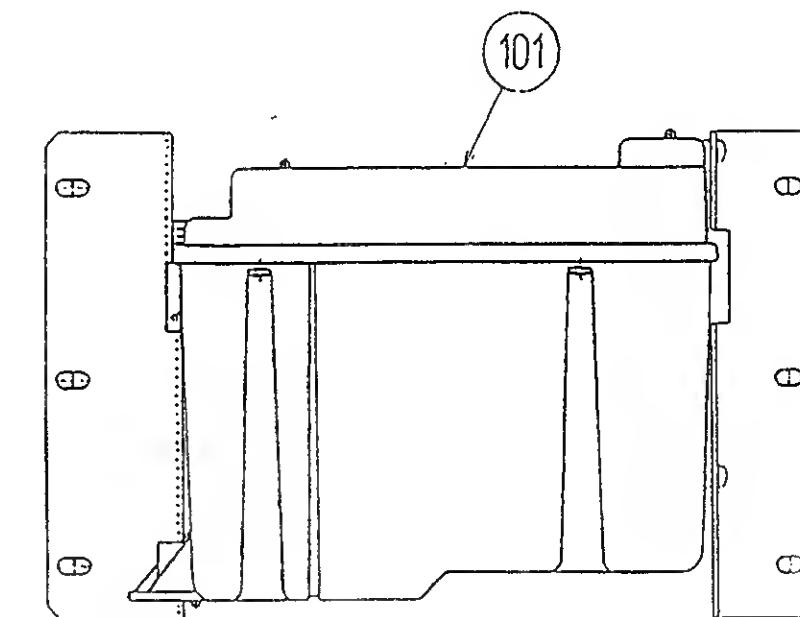
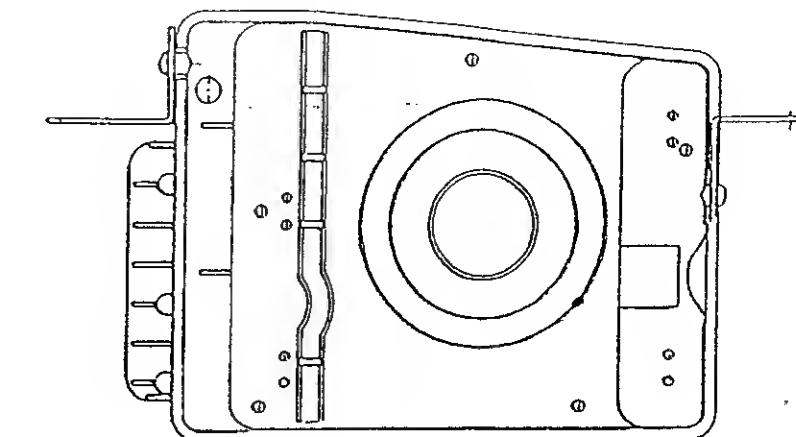
⑩ ASSY SEAT 1P (GWS1-1060), 2P (GWS1-1070)



⑩ ASSY SEAT 1P (GWS1-1060), 2P (GWS1-1070)

ITEM	PART NUMBER	DESCRIPTION	NOTE
1	130-5114	SPEAKER BOX SUB WOOFER	
2	GWS-1061	SEAT COVER 1P	
	GWS-1071	SEAT COVER 2P	
3	GWS-1062	HEAD REST	
4	DYN0-2131	UPPER SEAT	
5	DYN0-2132	LOWER SEAT	
6	DYN1-2081	SEAT FRAME	
7	GWS1-1063	HEAD REST BRKT	
8	GWS1-1064	SEAT BASE	
9	GWS1-1065	FOOT COVER	
101	6011-7493	SEAT RAIL L	
102	6011-7494	SEAT RAIL R W/ADJUSTER	
201		M SCR TH CRM M4X10	
202		SPLIT LOCK WASHER 1/4 INCH	
203		ALLEN HEAD BOLT 1/4 X 20 X 1 1/2 INCH	
204		FLAT WASHER CRM 4.4 - 16 X 1.6	
205		HEX BOLT 1/4 X 20 X 2 INCH	
206		SEAT WASHER (SPECIAL)	

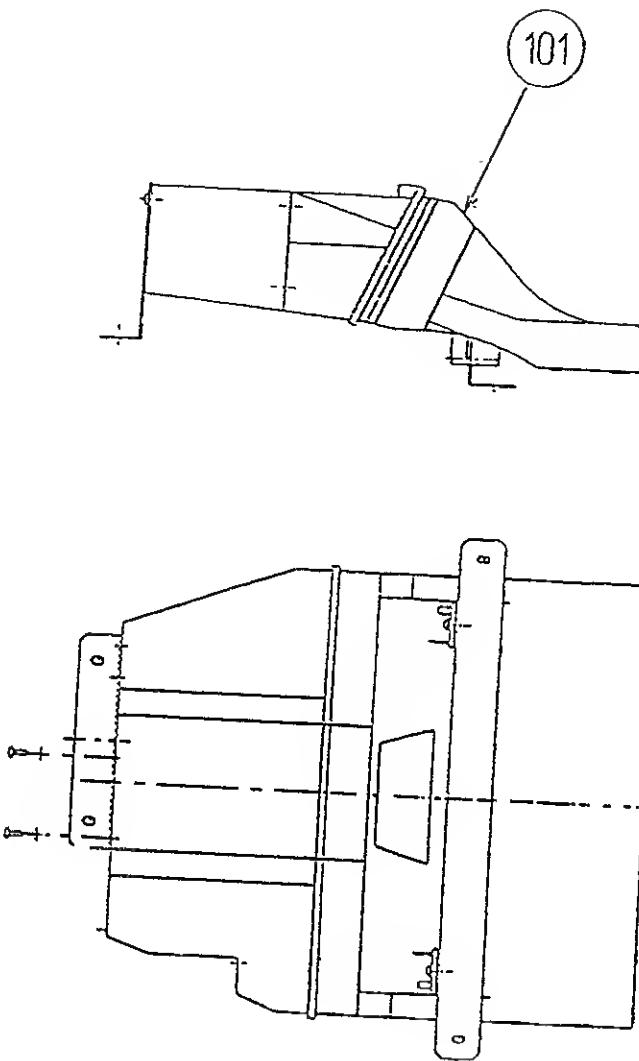
SEAT WOOFER



ITEM	PART NUMBER	DESCRIPTION	NOTE
101	130-5114	SPEAKER BOX SUB WOOFER	



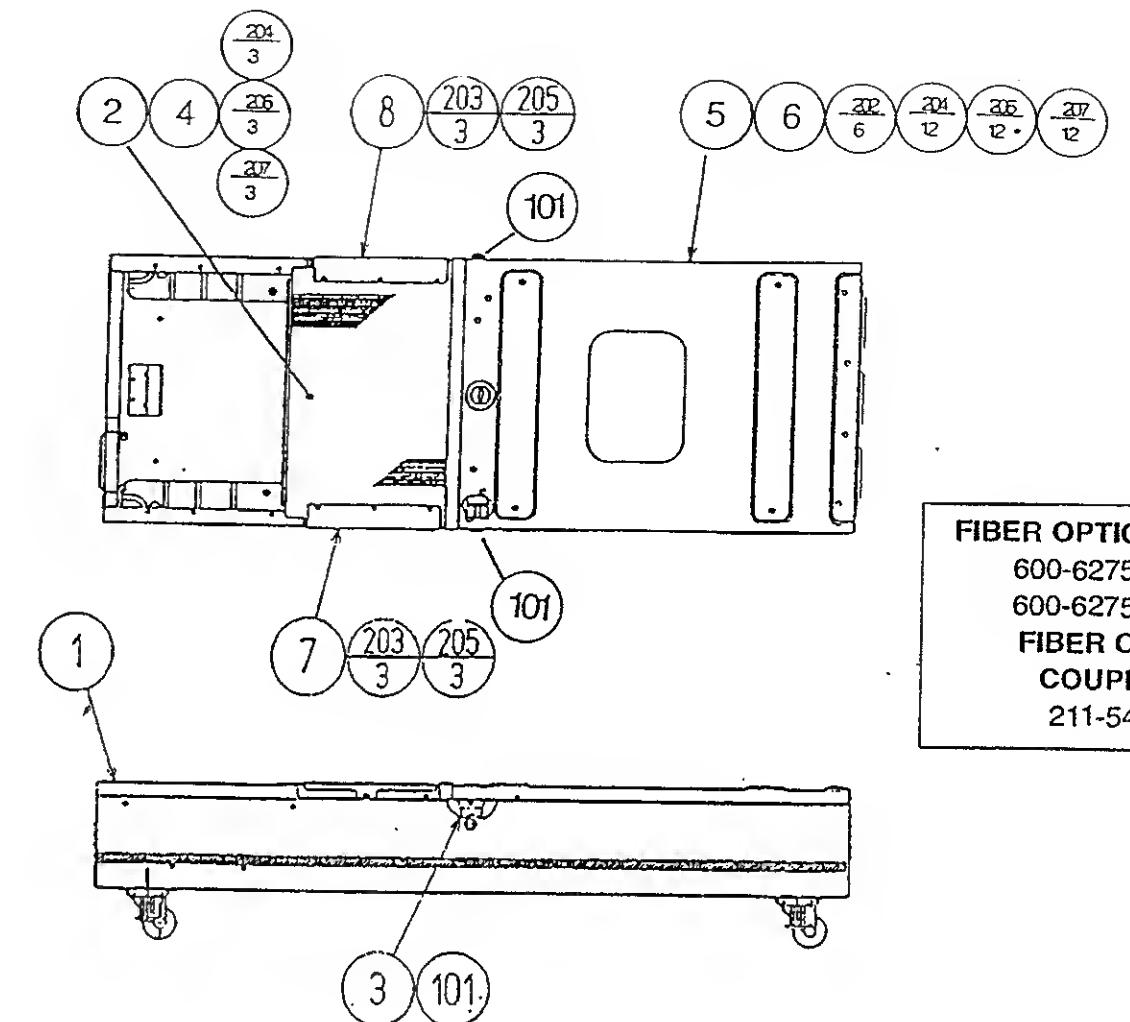
SPEAKER ASSEMBLY LEFT & RIGHT



ITEM	PART NUMBER	DESCRIPTION	NOTE
101	130-5113	SPEAKER BOX DOME	USED ON LEFT & RIGHT SIDES



ASSY BASE BOX

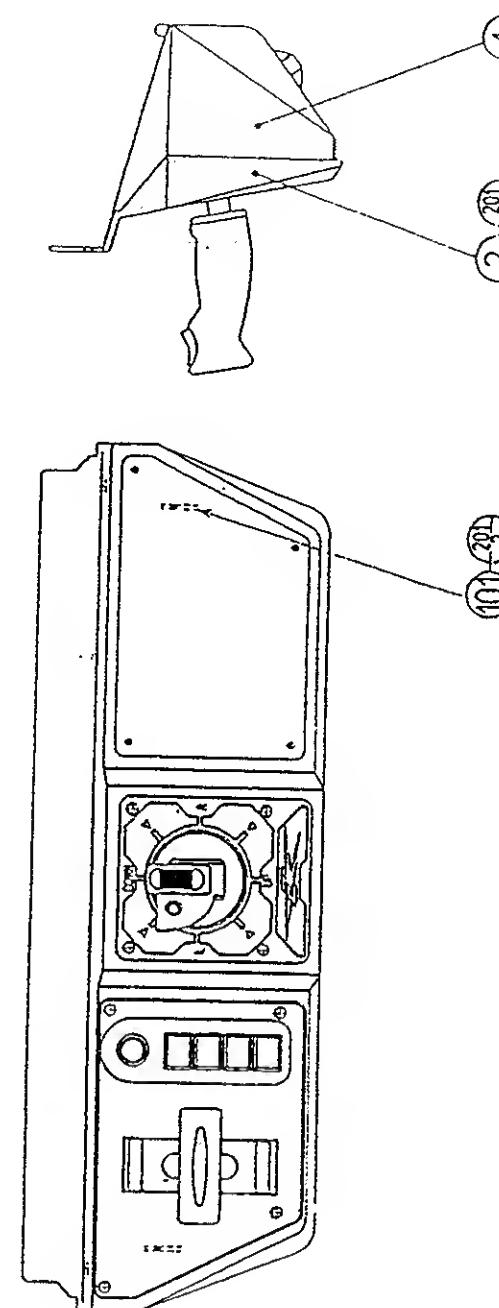


FIBER OPTIC CABLES  
600-6275-0300  
600-6275-0500  
FIBER OPTIC  
COUPLER  
211-5479

ITEM	PART NUMBER	DESCRIPTION	NOTE
1	DYNI-2002	MAIN BASE	
2	DYNI-2003	BASE LID F	
3	DYNI-2004	LOCK TNG	
4	DYNI-2005	FLOOR MAT	
5	DYNI-2006	HINGE 480	
6	DYNI-2010	ASSY BASE LID R	
7	DYNI-2007	LID EDGE L	
8	DYNI-2009	LID EDGE R	
202	999-0168	LOCK & KEY #399	SCREW MS 5 ST 08-32X12 56 8T TP
204	031-000514-OB	BOLT CB S NP 010-32X20 SQ	
206	050-F00500	NUT LOCK ZN 010-24 ELHSS	
		WASHER FL ZN 1/2 O.D.	
	999-0309	LOCK CAM RIGHT	
	999-0310	LOCK CAM LEFT	



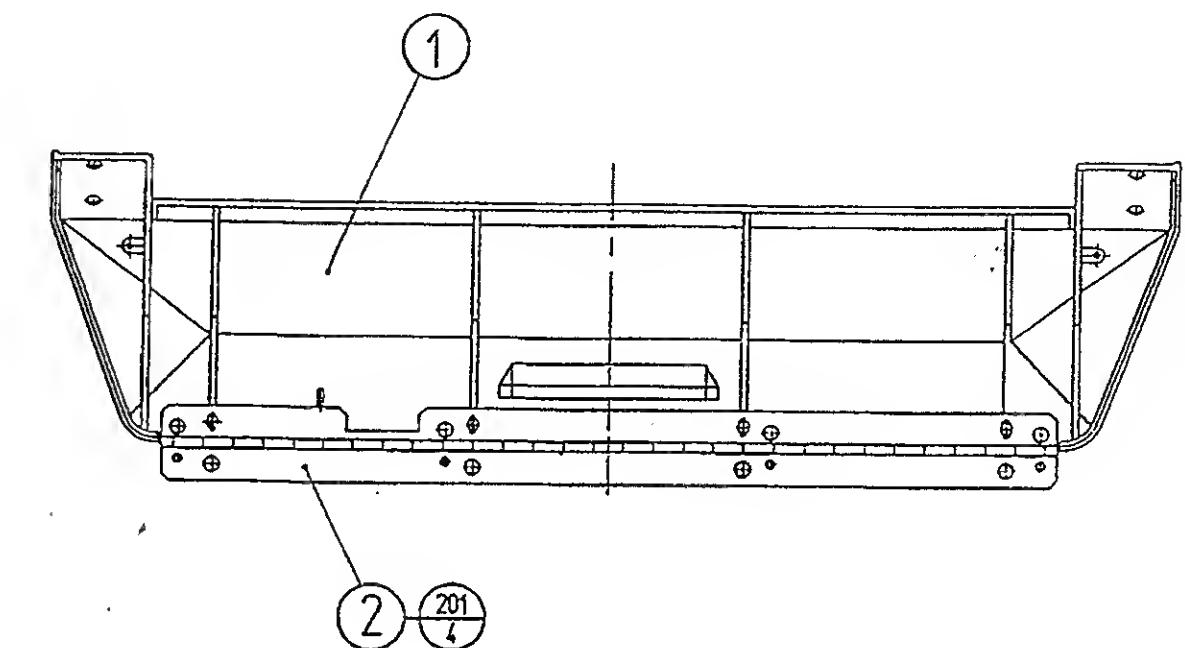
19 ASSY CONT PNL 1P (GWS-2000)



ITEM	PART NUMBER	DESCRIPTION	NOTE
1	GWS-2020	ASSY CONT PNL LOWER	
2	GWS-2040	ASSY CONT PNL UPPER 1P	
101	601-7365-240	BALL CHAIN L=240	
201	000-P00408-W	M SCR PH W/FS M4X8	
301	600-6390-15	WIRE HARN EXT CNTR PNL	

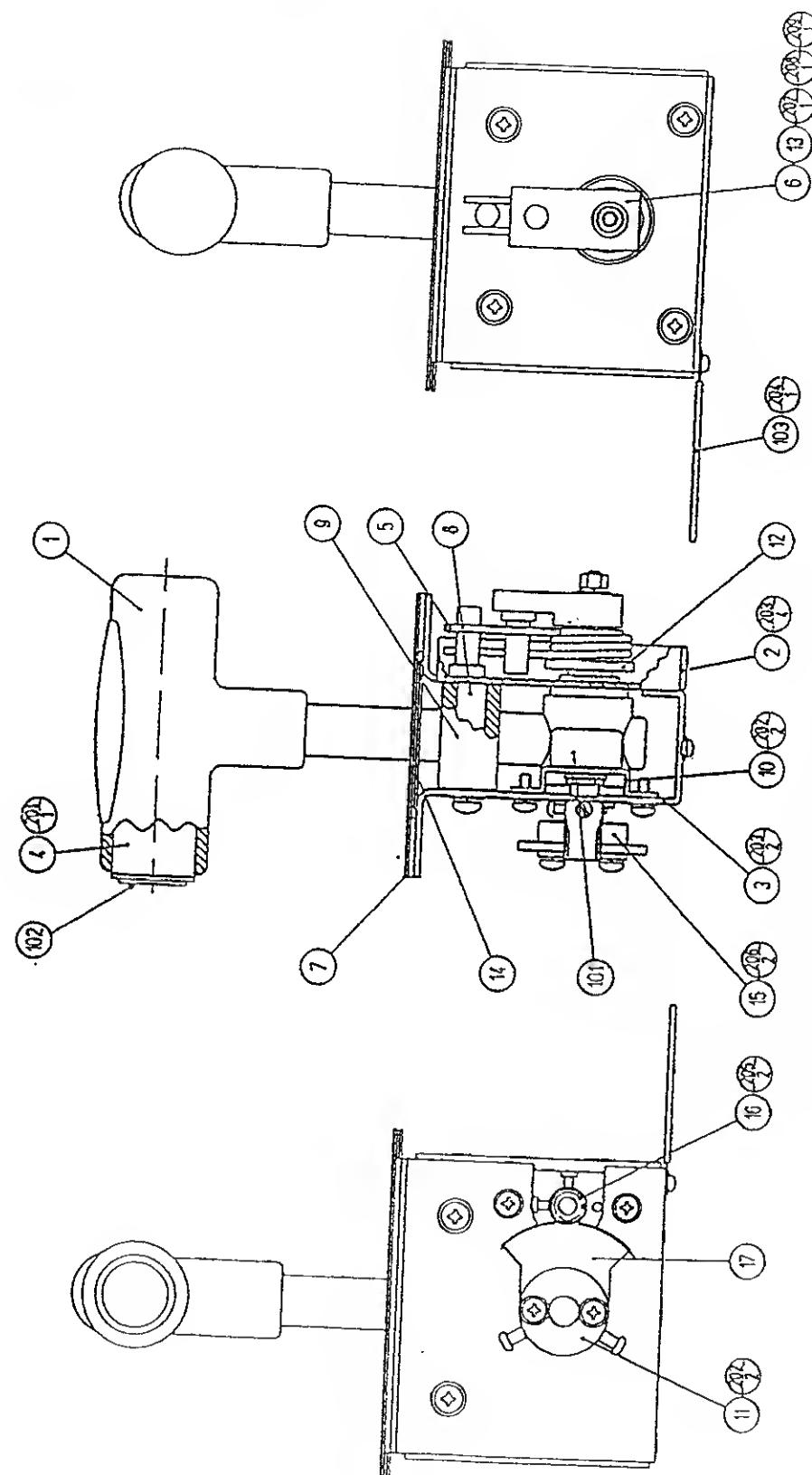


20 ASSY CONT PNL LOWER (GWS-2020)



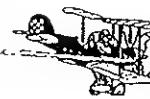
ITEM	PART NUMBER	DESCRIPTION	NOTE
1	GWS-2021	CONT PNL LOWER	
2	GWS-2022	HINGE 600	
201	000-P00408-W	SCR PH W/FS M4X8	
301	600-6390-18	WIRE HARN EARTH CNTR PNL	



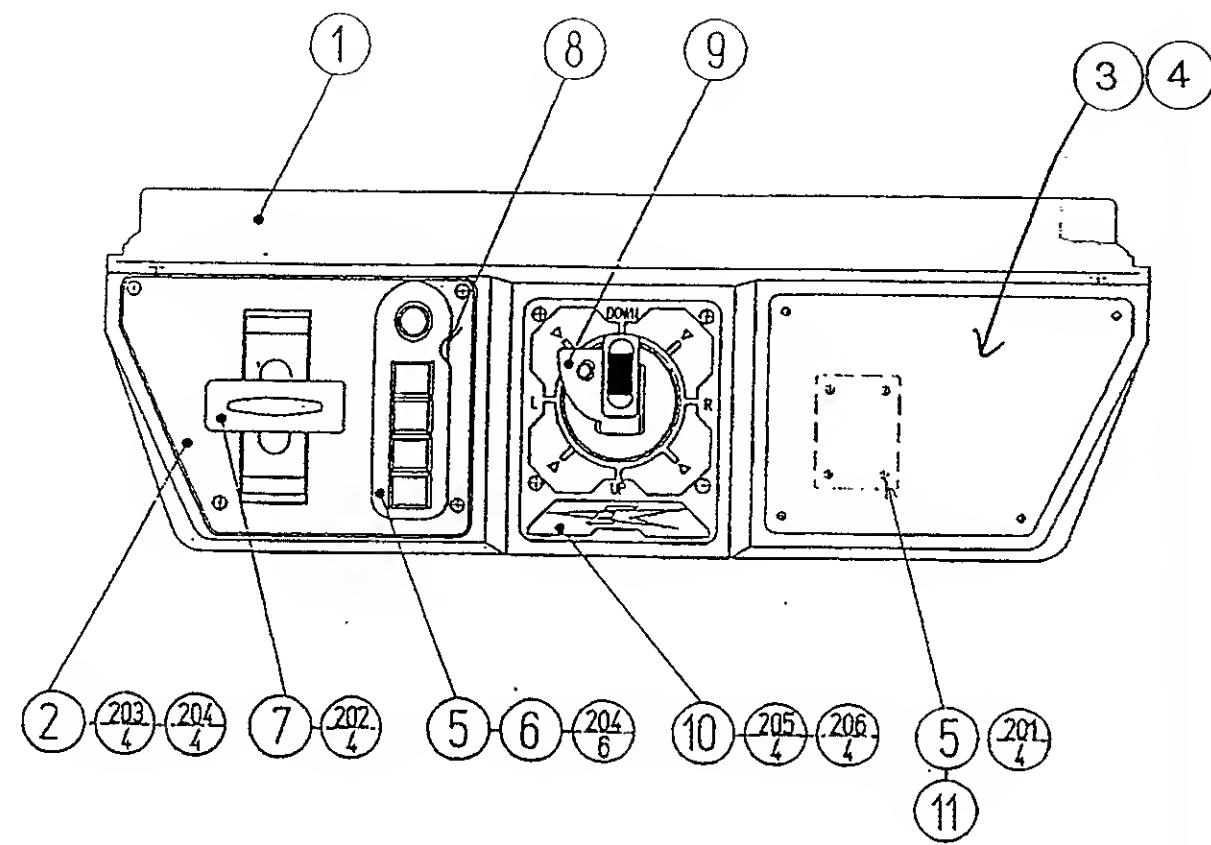


TORQUE : M3 TYPE 8kgf·cm, M3 TYPE SET SCREW 13kgf·cm.  
 M4 TYPE 18kgf·cm, M4 TYPE SET SCREW 25kgf·cm.  
 M5 TYPE 35kgf·cm.

ITEM NO.	PART NO.	DESCRIPTION
1	GFR-2101	THROTTLE LEVER
2	GFR-2102	BASE BRKT R
3	GFR-2103	BASE BRKT L
5	GFR-2105	TORSION SPRING
6	GFR-2106	TORSION BAR
7	GFR-2107	HOLE COVER
8	GLC-2105	STOPPER POST
9	GLC-2106	RUBBER STOPPER
10	GLC-2107	VR BRKT
11	GLC-2122	GEAR PLATE
12	GLC-220B	SPACER A
13	GLC-221B	KEY 3×3×7
14	GLC-2303	SLIDE PLATE A
15	JI-3113	GUIDE RING
16	601-5410	GEAR 15 φ6
17	601-6005	ADJUST GEAR
18	GLC-2104	SW COLLAR
101	220-5130	VOL CONT B-5K OHM
101	220-5373	VOL CONT B-5K OHM
102	509-5156-06	SW PUSH BUTTON 1M RED W/O RING
103	280-0419	HARNESS LUG
201	000-F0040B-0B	M SCR FH BLK M4×8
202	000-P00412-W	M SCR PH W/FS M4×12
203	000-P00514-W	M SCR PH W/FS M5×14
204	010-P0030B-F	S-TITE SCR PH W/F M3×8
205	02B-C0030B-P	SET SCR CH CUP P M3×8
206	02B-C00416-P	SET SCR CH CUP P M4×16
207	050-H00500	HEX NUT M5
208	060-F00500	FLT WSHR M5
209	060-S00500	SPR WSHR M5
210	090-0012	SCREW LOCK (スリ-ボンF 1401C-200g RE0)
211	090-0013	GREASE (ショウワシェルセキユ RETINAX A)
301	600-6341-129	WIRE HARN THROTTLE
302	600-6390-0B	WIRE HARN THROTTLE SW



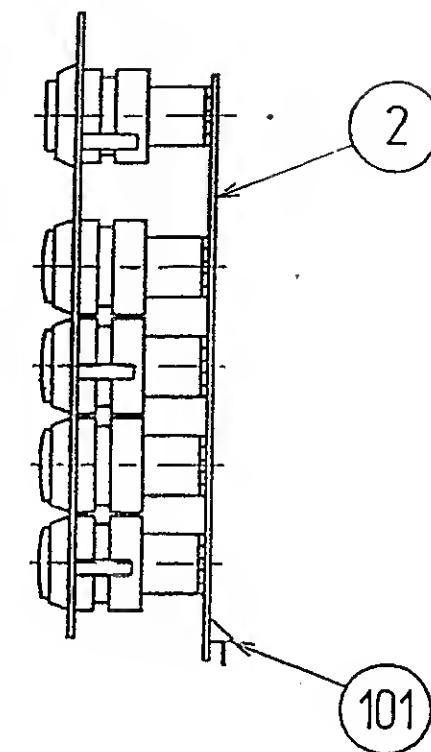
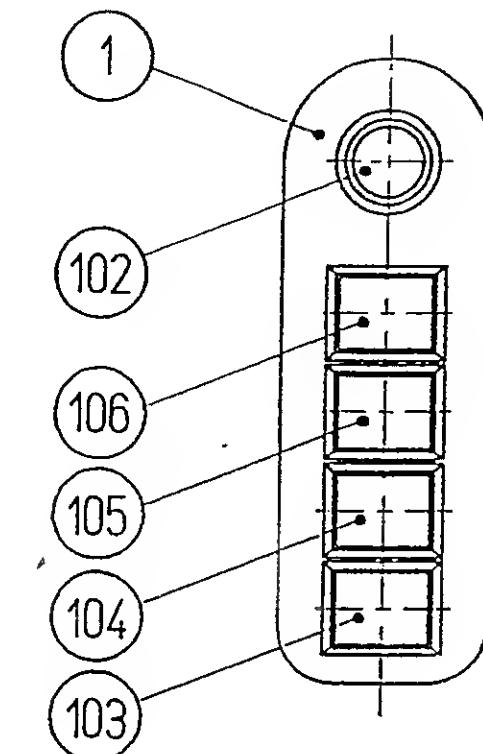
22 ASSY CONT PNL UPPER 1P (GWS-2040)



ITEM	PART NUMBER	DESCRIPTION	NOTE
1	GWS-2041	CONT PNL UPPER	
2	GWS-2042	PLATE L	
3	GWS-2043	PLATE R	
4	422-0488-01	PLAY INSTR SH WING WAR ENG	
5	GWS-2045	FLT WSHR PLASTIC 4.2-10X1	
6	GWS-2050	ASSY VIRTUAL BUTTON	
7	GWS-2030	ASSY THROTTLE	
8	SKJ-2007	PLATE SHEET	
9	610-0336	ASSY HAPP CONTROLLER W/WIRE	
10	GWS-2046	PLATE C 1P	
11	GWS-2047	AMP BD BRKT	
201	000-P00312-W	M SCR PH W/FS M3X12	
202	000-P00508-W	M SCR PH W/FS M5X8	
203	031-000414-0C	CRG BLT CRM M4X14	
204	050-F00400	FLG NUT M4	
205	031-000514-0C	CRG BLT CRM M5X14	
206	050-F00500	FLG NUT M5	

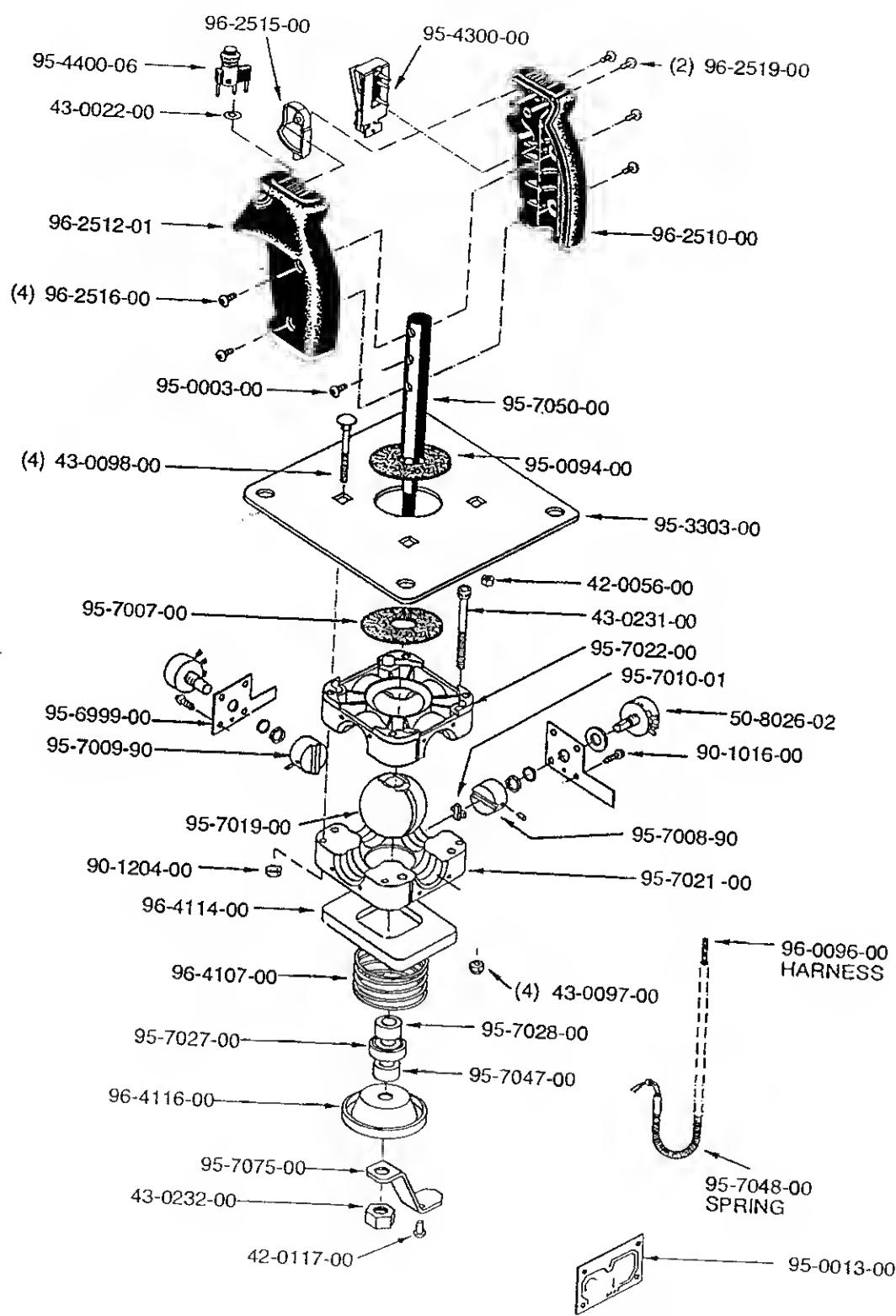


23 ASSY VIRTUAL BUTTON (GWS-2050)



ITEM	PART NUMBER	DESCRIPTION	NOTE
1	SKJ-2006	BUTTON PLATE	
2	171-6478B	PC BD LIGHTING SW X5	
101	212-5205-12	CONN JST M 12P RTA	
102	509-5560-Y	PB SW W/L 6V 1L Y	
103	509-5561-R	PB SW W/L 6V 5L R	
104	509-5561-S	PB SW W/L 6V 5L S	
105	509-5561-Y	PB SW W/L 6V 5L Y	
106	509-5561-G	PB SW W/L 6V 5L G	

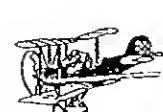
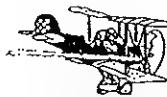


**ASSY HAPP CONTROLLER W/WIRE - 610-0336**


Drawing courtesy of Happ Controls

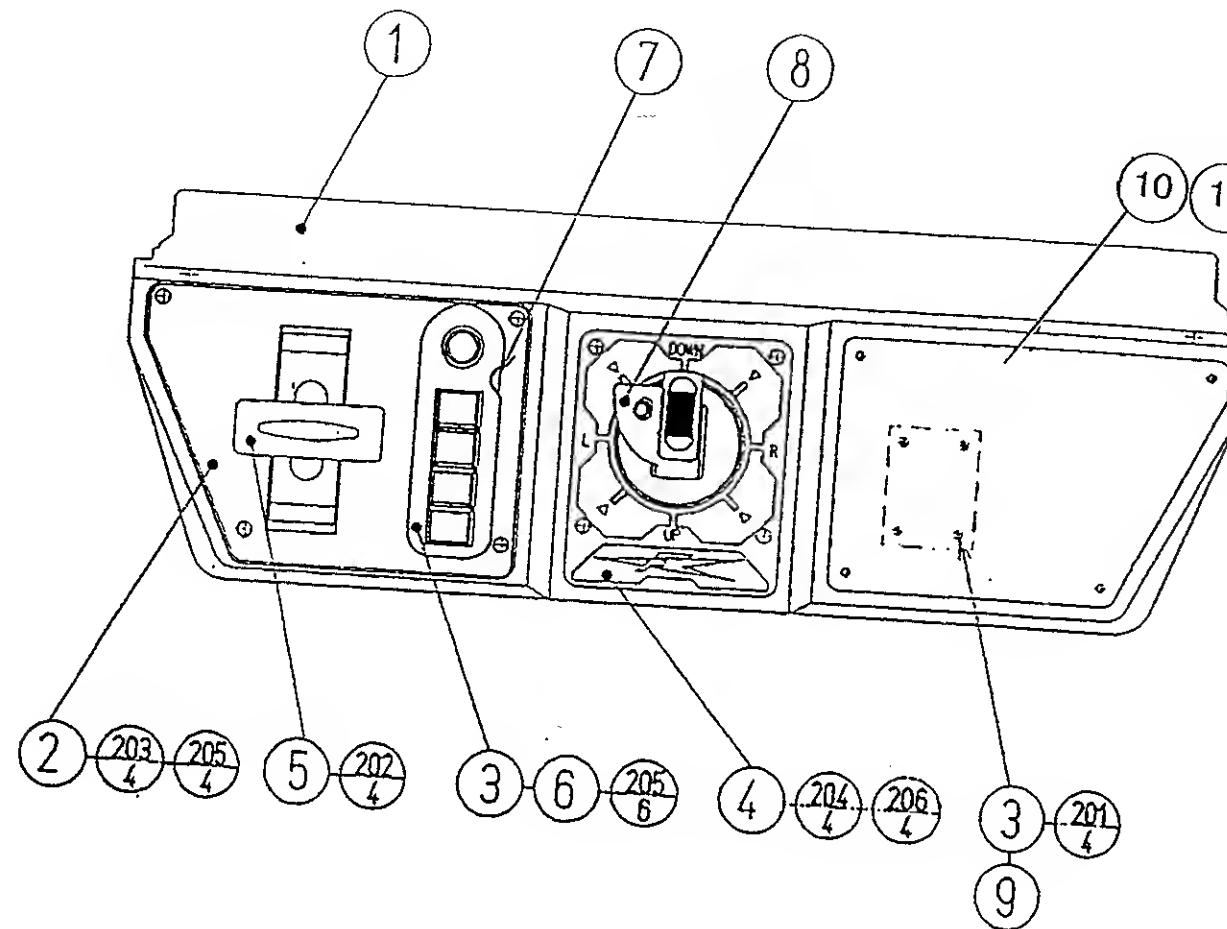
LEVEL	PART NUMBER	DESCRIPTION	QUANTITY
1	95-3303-00	MOUNTING PLATE ANALOG J/S "STAR WARS" F/SEGA STAR WARS	1
1	95-0094-00	WASHER ANALOG J/S W/.84 I.D. 4.75 O.D.	1
1	96-2560-00	WASHER ANALOG & H.D. J/S DIE CUT .97 ID X 2.75 OD	1
1	95-7022-00	HOUSIN UPPER ANALOG J/S	1
1	95-7021-00	HOUSING LOWER ANALOG J/S	1
1	96-4114-00	STOP MOLDED F/CONICAL RETURN	1
1	43-0231-00	SCREW, SOCK HD CAP, 1/4-20 X 1.75" BLACK OXIDE	4
1	43-0097-00	NYLOCK JAM NUT 1/4-20 .218 M GT	4
1	90-1016-00	SCREW FOR CONS. J/S SMALL #6 X 1/2 PHIL PAN HI-LO ZINC	8
1	95-7009-90	GROOVE RIDER "MACHINED" F/ANALOG J/S W/SET SCREW	1
2	95-7009-91	GROOVE RIDER "MACHINED" F/ANALOG J/S	1
2	43-0182-00	SCREW SET, 6-32 X 3/8 LG CUP PT	1
1	95-7008-90	GROOVED FOLLOWER "MACHINED" F/ANALOG J/S W/SET SCREW	1
2	95-7008-91	GROOVED FOLLOWER "MACHINED" F/ANALOG J/S	1
2	43-0182-00	SCREW SET, 6-32 X 3/8 LG CUP PT	1
1	95-7010-01	UNIV. JOINT, ANALOG J/S, MACHINED BRASS	1
1	43-0098-00	SCREW FLAT PHILLIPS HD M.S. 10-24 X 2.5" BLACK OXIDE	4
1	90-1204-00	NUT, 10-24 HEX W/SEMS BLACK OXIDE FINISH	4
1	95-7019-00	BALL PIVOT BEARING	1
1	95-7050-00	WELD ASSY RH GRIP ANALOG J/S	1
2	95-7004-00	TUBE 3/4" STRAIGHT FOR BANDIT GRIP	1
2	96-4104-00	SHAFT, JOYSTICK CONICAL RETURN CYBERSLED	1

LEVEL	PART NUMBER	DESCRIPTION	QUANTITY	LEVEL	PART NUMBER	DESCRIPTION	QUANTITY
1	95-7027-00	BEARING, BALL .5 ID X 1.13 OD .38 THK. NICE 407-22	1	2	95-4300-00	TRIGGER SWITCH ASSEMBLY, DA3	1
1	95-7028-00	SPACER .75 OD X .51 ID .375 LONG	1	3	95-4600-00	BRACKET, TRIGGER SWITCH	1
1	95-7047-00	SPACER LONG	1	3	96-6200-00	STACK, FIBER, .55 X .3 X .31	1
1	96-4116-00	SPRING KEEPER, F/ANALOG J/S W/ COMPR, SPRING, MOLDED	1	3	96-6300-00	BLADE, RETURN SPRING	1
1	95-7075-00	WIRE GUIDE STRAIGHT F/COMP SPRING ANALOG J/S	1	3	95-4610-00	BRACKET, SWITCH KEEPER	1
1	43-0232-00	NUT HEX THIN NYLOCK 1/2-20	1	3	43-0137-00	SCREW #4-40X 1/2" PH HD MS SELF TAPPING ZINC PLTD	2
1	96-4107-00	SPRING COMP F/ANALOG J/S MAIN RETURN CYBERSLED	1	3	95-4194-00	SWITCH, DA3 W/SHORT ACTUATOR 95-4119-00 & 95-4118-00	1
1	95-1224-00	HARNESS ASSY WING WARS J/S	1	4	95-4118-00	MICROSWITCH YELLOW ACTUATOR DA3ABWDD	1
2	96-0096-00	HARNESS ANALOG J/S 9 PIN RECEPT WW	1	4	95-4119-00	ACTUATOR, FLAT, .76" LONG DA3 CHERRY #0014-5576	1
2	96-4110-00	SPRING PROTECTOR 7 1/2" LENGTH FOR J/S HARNESS CYBERSLED	1	2	95-4400-06	THUMBSWITCH ASSY, BLK, DA1	1
2	96-4109-00	SPRING PROTECTOR 10 1/2" LENGTH FOR J/S HARNESS CYBERSLED	1	3	95-4505-00	BEZEL, THUMBSWITCH, FINISHED ZINC PLATED	1
2	95-7077-00	GROUND WIRE, HI FLEX, F/COMP SPRING ANALOG J/S	1	4	95-4500-00	BEZEL, THUMBSWITCH, NO FINISH	1
2	43-0281-00	RING TERMINAL NON INSULATED F/+ 6 STUD, 22-24 AWG WIRE	2	3	95-4510-06	PLUNGER, THUMBSWITCH, BLACK	1
2	95-0013-01	PCB ASSY POT AMP W/(2) 1 MF CAPS	1	3	43-0311-00	COMPRESSION SPRING F/THUMB BUTTON BEZEL	1
2	95-0029-00	STAND-OFF SNAP IN FOR POT AMP WHITE PLASTIC	4	3	95-4118-00	MICROSWITCH YELLOW ACTUATOR DA3ABWDD	1
2	90-1013-00	TIE WRAP 3 3/8 LENGTH	2	3	43-0999-00	SCREW #2-56X 1/2 PH PN HD IPS MACH	1
2	50-8026-02	POTENTIOMETER, 5K, .750 LG SHAFT W/FLAT PEC#KU5021F24HL NUT & WSH	2	3	95-4515-00	NUT, SPECIAL 15/32 X 32 KNULED	1
2	95-6999-00	POT MOUNTING PLATE ANALOG J/S W/WIRE ANCHOR	2	2	96-2510-00	HANDLE, RIGHT OUTER 0307-00925-0100	1
2	43-0018-00	LOCKWASHER INT. 3/8" F/POT	2	2	96-2512-01	HANDLE RIGHT INNER BALLY0A57-00910-0100	1
1	42-0056-00	NUT 6/32 HEX W/SEMS ZINC PLATE	1	3	96-2512-00	HANDLE RIGHT INNER BALLY 0307-00924-0100	1
1	95-0003-00	SCREW 4-40X.25 PHIL PAN HD THREAD FORMING ZN PLATE	1	2	96-2515-00	TRIGGER RED NEW STYLE "95-2515-10 OLD STYLE FIRST"	1
1	42-0117-00	SCREW, 6/32 X 1/4 PHIL, HD, MS THREAD FORMING	1	2	96-2519-00	SCREW, 6X3/4 HI-LOW BLACK OXIDE	2
1	95-7077-00	GROUND WIRE, HI FLEX, F/COMP SPRING ANALOG J/S	1	2	96-2516-00	SCREW, 10-32 X 3/8 BUTTON, HD TORX T-20 TAMPER PROOF	4
1	95-7076-00	JUMPER WIRE F/GROUNDING SWITCHES TO HANDLE TUBE	1	1	43-0066-00	WASHER, FLAT #4 .025 THX	1
1	90-1013-00	TIE WRAP 3 3/8 LENGTH	6	1	96-0703-01	TUBING, HEAT SHRINK 1/8"X.62 CUT FROM 96-0703-00	1
1	50-2507-00	RH GRIP ASSY, W/BLK THUMBSWITCH	1	2	96-0703-00	TUBING, HEAT SHRINK, 1/8" I.D. PER INCH SEE 96-0703-01	1



24

## ASSY CONT PNL UPPER 2P (GWS-2080)

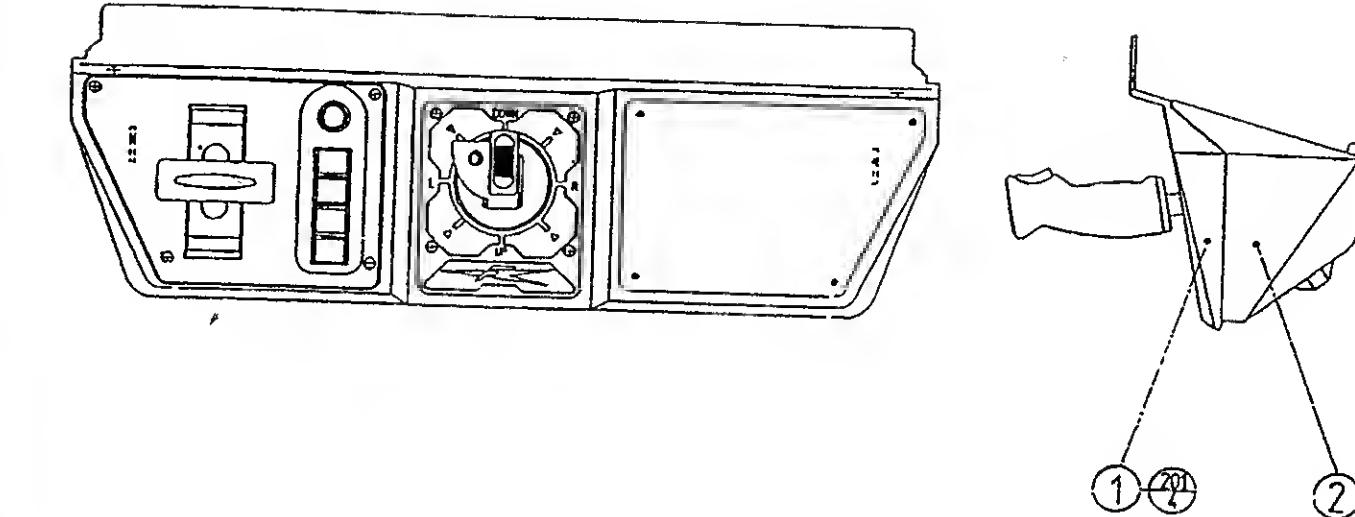


ITEM	PART NUMBER	DESCRIPTION	NOTE
1	GWS-2041	CONT PNL UPPER	
2	GWS-2042	PLATE L	
3	GWS-2045	FLT WSHR PLASTIC 4.2-10X1	
4	GWS-2081	PLATE C 2P	
5	GWS-2030	ASSY THROTTLE	
6	GWS-2050	ASSY VIRTUAL BUTTON	
7	SKJ-2007	PLATE SHEET	
8	610-0336	ASSY HAPR CONTROLLER W/WIRE	
9	GWS-2047	AMP BD BRKT	
10	GWS-2043	PLATE R	
11	422-0488-01	PLAY INSTR SH WING WAR ENG	
201	000-P00312-W	M SCR PH W/FS M3X12	
202	000-P00506-E	M SCR PH W/FS M5X8	
203	031-000414-0C	CRG BLT CRM M4X14	
204	031-000514-0C	CRG BLT CRM M5X14	
205	050-F00400	FLG NUT M4	
206	050-F00500	FLG MUT M5	



25

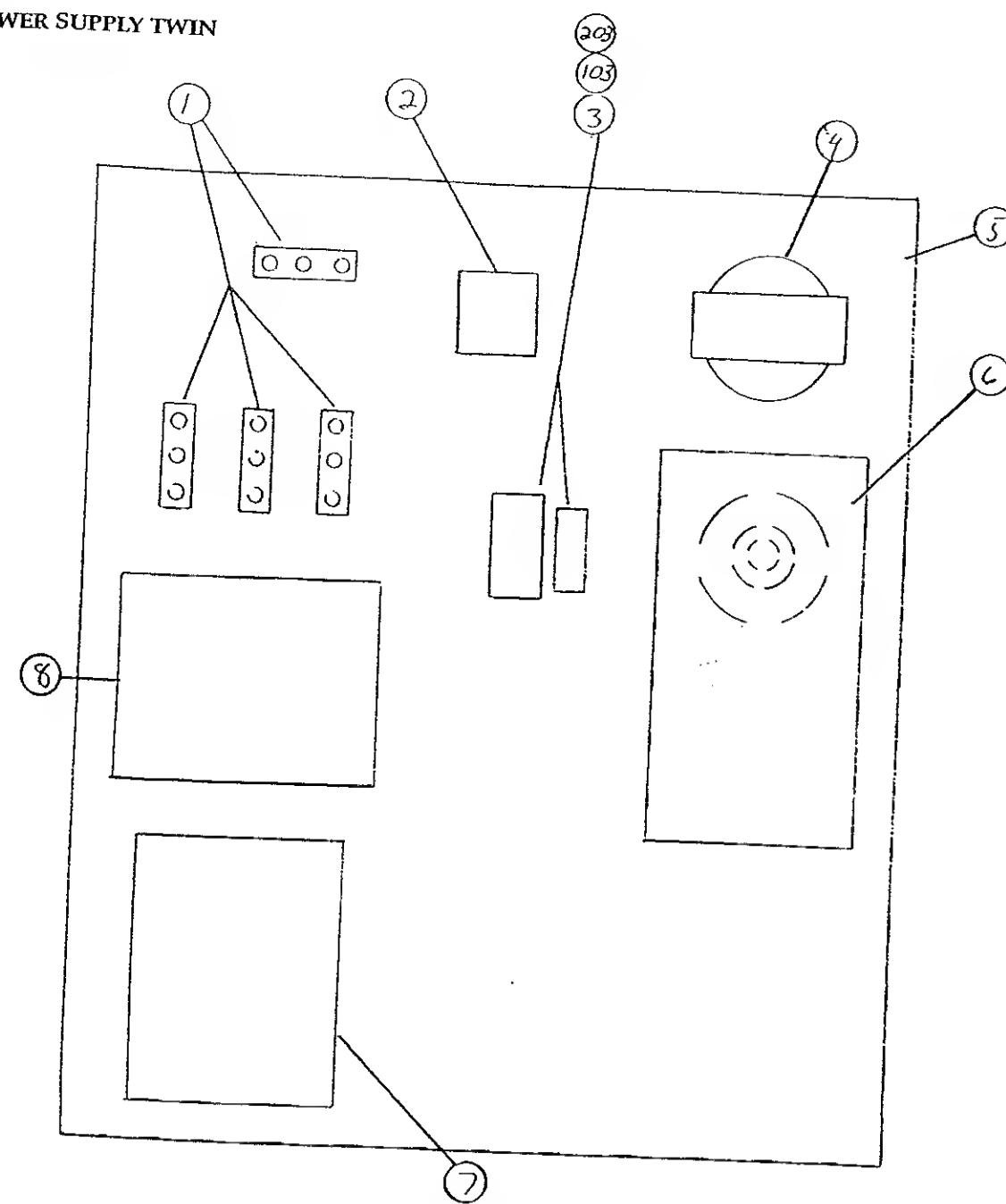
## ASSY CONT PNL 2P (GWS-2100)



ITEM	PART NUMBER	DESCRIPTION	NOTE
1	GWS-2080	ASSY CONT PNL UPPER 2P	
2	GWS-2020	ASSY CONT PNL LOWER	
301	600-6390-15	WIRE HARN EXT CNTR PNL	



POWER SUPPLY TWIN



ITEM	PART NUMBER	DESCRIPTION	NOTE
1		BRACKET	
2		LINE FILTER	
3		FUSE HOLDER	
4	5601-5266	TRANSFORMER (12.5V 6A) (18V 6A)	OTHER TAPS NOT USED
5		WOOD BASE	
6	999-0102	150 WATT POWER SUPPLY	
7	838-1014	AMP WITH MIXER	
8	838-10785	AMP	
103		FUSES 10A, 6A 250V	
203		FUSE LABEL	

